# IWM CONSULTING GROUP, LLC
## Health & Safety Plan

**PREPARED FOR:**

Amphenol Corporation
(Customer Name)

Franklin, IN
(Project location)

980 B Hurricane Road, Franklin, IN
(Address)

IN.AMP17
(Project number)

| Ongoing | Ongoing |
|---|---|
| Start Date | End Date |

**PREPARED BY:**

| Mandy Haynes | 8/30/2018 |
|---|---|
| Name | Date |

**APPROVED BY:**

| Mandy Haynes | - Office H&S Coordinator | Mandy Haynes | 8/30/2018 |
|---|---|---|---|
| Print Name | | Signature | Date |
| Brad Gentry | - Project Manager | | 8/30/2018 |
| Print Name | | Signature | Date |

**ADDITIONAL APPROVALS**
(if required)

| Print Name | Title | Signature | Date |
|---|---|---|---|
| Print Name | Title | Signature | Date |
| Print Name | Title | Signature | Date |

## PURPOSE

This document defines the Health and Safety considerations for the on-site management activities by IWM CONSULTING personnel and contractors. This document is required by IWM CONSULTING policies and programs and **OSHA 29 CFR 1910.120**. The basic requirements for the health and safety of the project workers are delineated in the IWM CONSULTING Health and Safety procedures. All personnel on site will be informed about the pertinent sections of the Health and Safety Plan.

## I. Type of Project

Check appropriate categories (more than one may apply)

| | | | |
|---|---|---|---|
| o | Tank Decontamination | o | On-site Treatment |
| o | Tank Excavation and Removal | o | Confined Space |
| o | Soil Excavation | X | Drilling |
| o | Filter Press Operation/Dewatering | X | Gauging/Sampling |
| o | Drum Sampling & Management | O | Installation System |
| o | Other _____ | X | Other – System Operations and Maintenance _____ |

## A. Scope of Work

(Detailed description of project, including types of major equipment to be used, quantities of material to be managed, contaminants, number of specific job locations, (i.e., number of tanks, number of wells, sumps, etc.).

Equipment: Submersible pumps, air stripper, air stripper blower, vapor carbon

Bi-weekly O&M: Record depth to water (DTW) in all recovery wells, inspect for leaks, obtain totalizer readings and system values including air stripper pressure

Monthly O&M: Record DTW at select monitoring wells, change sediment filters, record system readings

Quarterly O&M: Disassemble and clean stripper trays and sump, check and clean discharge pipe and P-trap.

Semi-annual O&M: Disassemble and clean stripper trays and sump, check and clean discharge pipe and P-trap, perform blower maintenance as directed

Semi-annual Groundwater Sampling: Obtain groundwater samples from select monitoring wells with bottom loading, weighted bailer. Check for DNAPL.

Drilling: Oversee the installation of soil borings, monitoring wells, and soil gas points using a Geoprobe.

Collecting soil, groundwater, and air samples. Traffic control may be necessary if the work is being performed in the right-of-way.

NOTE: * **Appendix A - Appendix A should contain a site map which indicates existing facilities, work zones, evacuation routes, etc.**

**B. Site Location Information**

1. Site Description: Former Amphenol Facility. The site's surface is mainly grass covered with asphalt driveways and parking lots. Remediation system shed is located on the grassy area south of the main Building & most site activities will take place in the grass area south of the building. Currently Grayson Thermal Systems and Miller Chemical occupy the former Amphenol Facility site.

2. Site History: Environmentally impacted waste water was historically (~1961-1981) discharged to the old sanitary sewer. The waste water was subsequently released into the subsurface via cracks in the sanitary sewer and Site soils and groundwater are known to be impacted by chlorinated solvents. A groundwater pump and treat system with 5 recovery wells is currently operational at the Site.

3. Area of Concern: Subsurface soil, groundwater, and soil gas.

4. Neighborhood Description: Residential directly south of the Site, mix of residential, commercial, industrial, & agricultural west, east, and north of the Site.

5. Topography and Site Access: The Site is relatively flat and the entrance is from the east side, along Hurricane Road.

6. Additional Information:

## II. Hazard Evaluation

A. Physical Hazards (trenches, utilities, noise, biological, etc.)

| | | | |
|---|---|---|---|
| Auto Traffic X | Fire | Explosion | Trenches |
| Overhead Utilities X | Underground Utilities X | | Noise X |
| Slip Trip Fall X | Uneven Terrain | | Biological |
| Other: Describe | | | |

**Note: * Appendix B: Attach a "hazard evaluation" for each task as part of Appendix B. (Tasks, Associated Risks and Hazards, Control Measures)**

B. Chemical Hazards

**The following substances, are known or suspected to be on-site or are to be used on site. The primary hazard of each are identified.**

| Chemical Name | PEL/TLV* | IDLH** | Exposure Route | Symptoms | First Aid |
|---|---|---|---|---|---|
| **Trichloroethene** | 100 ppm 200-C | 1000 ppm | Inhalation, ingestion, skin, and/or eye contact | Irritation eyes, skin; headache, visual disturbance, lassitude (weakness, exhaustion), dizziness, tremor, drowsiness, nausea, vomiting; dermatitis; cardiac arrhythmias, paresthesia; liver injury; [potential occupational carcinogen] | Eye: **A** Skin: **E** Breath: **C** Swallow: **D** |
| **Tetrachloroethene** | 100 ppm 200 ppm-C | 150 ppm | Inhalation, ingestion, skin, and/or eye contact | Irritation eyes, skin; headache, visual disturbance, lassitude (weakness, exhaustion), dizziness, tremor, drowsiness, nausea, vomiting; dermatitis; cardiac arrhythmias, paresthesia; liver injury; [potential occupational carcinogen] | Eye: **A** Skin: **E** Breath: **C** Swallow: **D** |
| **1,1,1-Trichloroethane** | 350 ppm | 700 ppm | Inhalation, ingestion, skin, and/or eye contact | Irritation eyes, skin; headache, lassitude (weakness, exhaustion), central nervous system depression, poor equilibrium; dermatitis; cardiac arrhythmias; liver damage | Eye: **A** Skin: **E** Breath: **C** Swallow: **D** |
| **Cis-1,2-Dichloroethene (acetylene dichloride)** | 200 ppm | 1000 ppm | Inhalation, ingestion, skin, and/or eye contact | Irritation eyes, respiratory system; central nervous system depression | Eye: **A** Skin: **E** Breath: **C** Swallow: **D** |
| **1,2-Dichloroethane** | 500 ppm | 50 ppm | Inhalation, ingestion, skin, and/or eye contact | Irritation of the mouth, throat, lungs, and nose; nausea, vomiting, headache, and dizziness; and liver and kidney damage | Eye: **A** Skin: **E** Breath: **C** Swallow: **D** |
| **Sampling preservatives** | | | | | |
| **Hydrochloric Acid** | 5ppm | 100ppm | Inhalation, skin and eye contact | Inhalation: cough, choking Contact: burns and tissue death | Eye: **A** Skin: **E** Breath: **C** Swallow: **D** |
| **Methanol (Methyl Alcohol)** | 200ppm | 25,000ppm | Inhalation, ingestion, skin absorption | Inhalation & ingestion: irritation of eye & nose, headache, fatigue, nausea, visual impairment, respiratory failure, Skin absorption–feeling of coldness, dryness, headache, fatigue & visual disturbance. | Eye: **A** Skin: **E** Breath: **C** Swallow: **D** |
| **Sulfuric Acid** | 1mg/m$^3$ | 80mg/m$^3$ | Inhalation, skin & eye contact | Inhalation: coughing, sneezing, nose irritation, nose bleeds, shortness of breath. Ingestion: burns of mucous membranes, nausea, vomiting. Contact: severe burns, initially zone of contact is bleached, then turns brown. | Eye: **A** Skin: **E** Breath: **C** Swallow: **D** |
| **Nitric Acid** | 2ppm | 100ppm | Inhalation, ingestion, skin/eye contact | Inhalation: may take hour & include throat and nose irritation, cough, chest pain, breathing difficulty, salivation, giddiness, nausea. Contact: depending on % of nitric acid burns, staining of skin. Ingestion: immediate pain, digestive tract burns. | Eye: **A** Skin: **E** Breath: **C** Swallow: **D** |

Permissible Exposure Limit (OSHA) or Threshold Limit Value (ACGIH) for time-weighted average for an 8-hour workday or 40-day workweek.
** Immediately dangerous to life and health
Ca Potential Human Carcinogen, no NIOSH IDLH listed

**FIRST AID:** (A) Irrigate Immediately (B) Water Flush Immediately (C) Artificial Respiration
(D) Medical Attention Immediately (E) Soap Wash Immediately

**Note: Attachment C contains copies of MSDS for expected contaminants, if available**

C. Medical Monitoring

Entire crew received baseline physicals? [ ] YES [X] NO

If No, why not? _____

List any special tests required & frequency: None required

**III. Manpower**

| A. Crew Size | Number | Names |
|---|---|---|
| Project Manager | 1 | Brad Gentry |
| Hydrogeologist/Engineer | 1-3 | Chris Newell, various IWM Consulting personnel |
| H&S Officer | 1 | Mandy Haynes |
| Equipment Operator | 1 | |
| Technician | 1 | Duane White, Ralph Mier |
| Other | 1 | |

B. Contractor

Pre-qualified ☐ YES ☒ NO
(If no, see letter "C" below)

Enviro Dynamics
(Name)

7674 E. 157th Avenue
(Address)

Hebron, IN 46341
(City/State)

Rob Mores 219-313-4135
(Contact Name & Phone Number)

Scope of Work: Installation of soil borings/monitoring wells, temporary soil gas probes using a Geoprobe

Training Required: 40-Hour HAZWOPER and Annual 8-Hour Refreshers

Each Subcontractor must provide documentation of training, physical results and fit test at a minimum.

Subcontractor received required training? ☒ YES ☐ NO

Documented? ☒ YES ☐ NO

If no, Why:

C. If subcontractor is not pre-qualified, has pre-qualification package and contract approval been submitted to regional contract manager? ☐ YES ☒ NO

D. If NO, who has authorized used of subcontractor? Drilling has not yet been required for the project

B. Contractor

Pre-qualified ☐ YES ☒ NO
(If no, see letter "C" below)

Strata Environmental
(Name)

3445 W. 250 North
(Address)

Anderson, Indiana 46011
(City/State)

Michael Todd 765-602-3334
(Contact Name & Phone Number)

Scope of Work: Installation of soil borings/monitoring wells using a Geoprobe

Training Required: 40-Hour HAZWOPER and Annual 8-Hour Refreshers

Each Subcontractor must provide documentation of training, physical results and fit test at a minimum.

Subcontractor received required training? ☒ YES ☐ NO

Documented? ☒ YES ☐ NO

If no, Why:

C. If subcontractor is not pre-qualified, has pre-qualification package and contract approval been submitted to regional contract manager? ☐ YES ☒ NO

D. If NO, who has authorized used of subcontractor? Drilling has not yet been required for the project

B. Contractor

Pre-qualified ☐ YES ☒ NO
(If no, see letter "C" below)

SCS Environmental Contracting
(Name)

P.O. Box 8980
(Address)

Fort Wayne, Indiana 46898
(City/State)

Curt Luebbert 260-497-9006
(Contact Name & Phone Number)

Scope of Work: Installation of soil borings/monitoring wells using a Geoprobe

Training Required: 40-Hour HAZWOPER and Annual 8-Hour Refreshers

Each Subcontractor must provide documentation of training, physical results and fit test at a minimum.

Subcontractor received required training? ☒ YES ☐ NO

Documented? ☒ YES ☐ NO

If no, Why:

C. If subcontractor is not pre-qualified, has pre-qualification package and contract approval been submitted to regional contract manager? ☐ YES ☒ NO

D. If NO, who has authorized used of subcontractor? Drilling has not yet been required for the project

**IV. Equipment (describe type)**

| | | | |
|---|---|---|---|
| ☐ Decon/Shower | | ☐ Fork Truck | |
| ☐ Manlift | | ☐ Crane | |
| ☐ Backhoe | | ☐ Compressor | |
| ☐ Generator | | ☐ Tamper | |
| ☐ Hydraulic Ram | | ☐ Dump Truck | |
| ☐ Excavator | | ☐ Compactor | |
| × Pump(s) | | ☐ Vacuum Tanker | |
| ☐ Chainsaws | | ☐ Cutting Dvs | |
| × Drill Rig | | ☐ Torches | |
| × Other | Air stripper, blower | ☐ Other | |

**A.** Is any special training required? 40 Hour OSHA

**B.** Any task being performed for which an SOP is in place? If yes, list SOP training.

| | APPLICATION | TRAINING COMPLETED | TRAINING REQUIRED |
|---|---|---|---|
| 1. Locating Utilities | Yes | Yes | Yes |
| 2. Trenching and Excavating | No | | |
| 3. Confined Space Entry | No | | |
| 4. Grounding & Bonding | No | | |
| 5. Line Breaking | No | | |
| 6. Lockout/Tagout/Tryout | No | | |
| 7. Labelling | No | | |
| 8. Pressure Washer Operations | No | | |
| 9. Container Management | No | | |
| 10. Heavy Equipment Decontamination | No | | |
| 11. Scrap Metal Decontamination | No | | |
| 12. PCB Wipe Sampling | No | | |
| 13. Manifesting Procedures | No | | |
| 14. Guzzler Vacuum Truck Operating | No | | |
| 15. Operation of Squeeze Filter Presses | No | | |
| 16. Project File Management | No | | |
| 17. Scaffolding | No | | |
| 18. Modutank Setup | No | | |

**V.Levels of Protection:**
Special protective equipment for each level of protection is as follows:

Level A:
- Fully-encapsulating chemical resistant suit
- pressure demand atmosphere supplying respirator
- inner chemical resistant gloves
- radio communications
- chemical resistant safety boots/shoes
- cooling unit *
- coveralls *
- hard hat *
- disposable gloves and boot covers

Level B:
- Pressure demand, atmosphere supplying respirator
- chemical resistant, protective clothing
- inner and outer chemical resistant gloves
- chemical resistant safety boots/shoes
- hard hat *
- radio communications
- coveralls *
- disposable boot covers *
- face shield *
- long cotton underwear *

Level C:
- Chemical resistant protective clothing
- face shield *
- full face piece air purifying respirator
- inner and outer chemical resistant gloves
- escape mask *
- chemical resistant safety boots/shoes
- long cotton underwear *
- coveralls *
- hard hat *
- disposable gloves and boot covers

Level D:
- Escape mask*
- Safety glasses or goggles*
- face shield*
- inner and outer chemical resistant gloves*
- chemical resistant safety boots/shoes
- hard hat *
- coveralls *
- earplugs *

Safety glasses and safety boots are recommended on all sites, without respect to the work being performed. Hardhats should be worn during installation, construction, drilling, or when other overhead hazards are present. Earplugs are should be worn during drilling, jackhammering, and during other such loud activities. In addition, safety vests are advised (& may be required) during gauging and/or sampling activities. * Optional depending upon the task being completed

NO CHANGES TO THE SPECIFIED LEVELS OF PROTECTION SHALL BE MADE WITHOUT THE APPROVALS OF THE SAFETY COORDINATOR AND THE HYDROGEOLOGIST AT A MINIMUM

**V. Worker Protection**

Please complete a form for **each** work task

A. Task Description: **System O&M**

**Level** [ ] **A** [ ] **B** [ ] **C** [X] **D**

B. Respiratory Protection (check type which applies)

☐ Air Purifying

Full Mask _____ Cartridge Type _____ Dust Mask _____

☐ Supplied Air

SCBA _____ Airline _____ Escape Bottle _____ Other _____

Breathing Air Certificate on file _____ If no, breathing air tested _____

C. Protective Clothing

Hard Hat _____

**Eye Protection**

| | | | |
|---|---|---|---|
| _____ | Full face respirator | X | Safety glasses |
| _____ | Chemical resistant goggle | _____ | Face shield |
| _____ | Other | | |

**Bodysuit**

| | | | | | |
|---|---|---|---|---|---|
| _____ | Tyvek | _____ | Hooded | _____ | Sewn seam |
| _____ | Polytyvek | _____ | Hooded | _____ | Sealed seam |
| _____ | Saranex/CPF | _____ | Hooded | _____ | Strapped seam |
| _____ | Rain gear (PVC) | | Hooded | | |
| _____ | Proshield (polypropylene) | | Hooded | | |
| _____ | Other | | | | |

**Gloves (Indicate "O" for Outer, "I" for Inner)**

| | | | |
|---|---|---|---|
| X | Inner nitrile (4 mil) | _____ | Leather for manual handling |
| _____ | Outer nitrile (11 mil) | _____ | Cotton |
| _____ | Butyl rubber | _____ | PVC |
| _____ | Neoprene | _____ | Viton |
| _____ | Neoprene (milled) | _____ | Silvershield |
| _____ | Other | _____ | Other |

**Boots**

| | | | |
|---|---|---|---|
| X | Leather - steel toed | _____ | PVC booties |
| _____ | PVC - Steel Toed | _____ | Tyvek booties |
| _____ | Neoprene - steel toed | _____ | Poly booties |
| _____ | Rubber slush boots | _____ | Other |
| | Latex (Nuke) booties | _____ | Other |

**Hearing Protection**

| | | | |
|---|---|---|---|
| _____ | Ear muffs | X | Ear plugs |
| _____ | Other | | |

**Note: This page may be duplicated for additional tasks**

**V. Worker Protection**

Please complete a form for **each** work task

A. Task Description: **Soil and Groundwater Sampling**

**Level** [ ] **A** [ ] **B** [ ] **C** [X] **D**

B. Respiratory Protection (check type which applies)

☐ Air Purifying

Full Mask _____ Cartridge Type _____ Dust Mask _____

☐ Supplied Air

SCBA _____ Airline _____ Escape Bottle _____ Other _____

Breathing Air Certificate on file _____ If no, breathing air tested _____

C. Protective Clothing

Hard Hat — As needed when overhead hazards present

**Eye Protection**

| | | | |
|---|---|---|---|
| _____ | Full face respirator | X | Safety glasses |
| _____ | Chemical resistant goggle | _____ | Face shield |
| _____ | Other | | |

**Bodysuit**

| | | | | | |
|---|---|---|---|---|---|
| _____ | Tyvek | _____ | Hooded | _____ | Sewn seam |
| _____ | Polytyvek | _____ | Hooded | _____ | Sealed seam |
| _____ | Saranex | _____ | Hooded | _____ | Strapped seam |
| _____ | Rain gear (PVC) | | | | |
| _____ | Proshield (polypropylene) | | | | |
| _____ | Other | | | | |

**Gloves (Indicate "O" for Outer, "I" for Inner)**

| | | | |
|---|---|---|---|
| X | Inner nitrile (4 mil) | _____ | Leather for material handling |
| _____ | Outer nitrile (11 mil) | _____ | Cotton |
| _____ | Butyl rubber | _____ | PVC |
| _____ | Neoprene | _____ | Viton |
| _____ | Neoprene (milled) | _____ | Silvershield |
| _____ | Other | _____ | Other |

**Boots**

| | | | |
|---|---|---|---|
| X | Leather – steel toed | _____ | PVC booties |
| _____ | PVC – Steel Toed | _____ | Tyvek booties |
| _____ | Neoprene - steel toed | _____ | Poly booties |
| _____ | Rubber slush boots | _____ | Other |
| | Latex (Nuke) booties | _____ | Other |

**Hearing Protection**

| | | | |
|---|---|---|---|
| _____ | Ear muffs | _____ | Ear plugs |
| _____ | Other | | |

**Note: This page may be duplicated for additional tasks**

## V. Worker Protection

Please complete a form for **each** work task

A. Task Description: **Oversee Drilling of Soil Borings, Monitoring Wells, and soil gas points**

| Level | | A | | B | | C | X | D |
|---|---|---|---|---|---|---|---|---|

B. Respiratory Protection (check type which applies)

☐ Air Purifying

Full Mask _____ Cartridge Type _____ Dust Mask _____

☐ Supplied Air

SCBA _____ Airline _____ Escape Bottle _____ Other _____

Breathing Air Certificate on file _____ If no, breathing air tested _____

C. Protective Clothing

Hard Hat As needed, when overhead hazards present

**Eye Protection**

| | | | |
|---|---|---|---|
| _____ | Full face respirator | X | Safety glasses |
| _____ | Chemical resistant goggle | _____ | Face shield |
| _____ | Other | | |

**Bodysuit**

| | | | | | |
|---|---|---|---|---|---|
| _____ | Tyvek | _____ | Hooded | _____ | Sewn seam |
| _____ | Polytyvek | _____ | Hooded | _____ | Sealed seam |
| _____ | Saranex | _____ | Hooded | _____ | Strapped seam |
| _____ | Rain gear (PVC) | | | | |
| _____ | Proshield (polypropylene) | | | | |
| _____ | Other | | | | |

**Gloves (Indicate "O" for Outer, "I" for Inner)**

| | | | |
|---|---|---|---|
| X | Inner nitrile (4 mil) | _____ | Leather for material handling |
| _____ | Outer nitril (11 mil) | _____ | Cotton |
| _____ | Butyl rubber | _____ | PVC |
| _____ | Neoprene | _____ | Viton |
| _____ | Neoprene (milled) | _____ | Silvershield |
| _____ | Other | _____ | Other |

**Boots**

| | | | |
|---|---|---|---|
| X | Leather – steel toed | _____ | PVC booties |
| _____ | PVC – Steel Toed | _____ | Tyvek booties |
| _____ | Neoprene - steel toed | _____ | Poly booties |
| _____ | Rubber slush boots | _____ | Other |
| | Latex (Nuke) booties | _____ | Other |

**Hearing Protection**

| | | | |
|---|---|---|---|
| _____ | Ear muffs | X | Ear plugs |
| _____ | Other | | |

**Note: This page may be duplicated for additional tasks**

## VI. Contamination Reduction and Decontamination

A. Describe how work zones will be set up and maintained*: **Traffic cones will be used to delineate the work area in traffic Areas. If working within a right-of-way (ROW), ROW permits will be obtained and the proper traffic controls will be utilized.**

B. **Decontamination Procedures:**

Personnel and equipment leaving an identified Exclusion Zone, (indicate in Section VI.A.) shall be thoroughly decontaminated.

The standard level "C" decontamination protocol shall be used with the following decontamination approach:

1. Wash gloves and/or boot covers using decon and water rinse.
2. Remove securing tape from wrists and ankles.
3. Remove disposable tyvek/or coveralls (without boots).
4. Remove boot covers and/or outer gloves.
5. Remove face mask respirator.
6. Remove inner gloves.

For Level "D," dress-down, follow steps 1,3,4,& 6, if protective equipment is worn.

Describe personnel decontamination procedures, if the procedures described above are not used:

Gloves will be removed and disposed of

Describe equipment decontamination procedures: Rinsed with alconox wash and water.

How is contaminated equipment disposed? In trash bags

Describe storage of usable protective gear: In gear bags

Describe laundering procedure for uniforms: N/A

| | |
|---|---|
| Locker room facility provided? | ☐ YES X NO |
| Will a decon trailer be on site? | ☐ YES X NO |

If no, how will crew change clothing and shower? At home

Describe provision for drinking water: Available in the company truck and in the adjacent Grayson Thermal Systems and Miller Chemical Buildings

Describe provision for restrooms: Adjacent Grayson Thermal Systems and Miller Chemical Buildings

Respirator cleaning and inspection procedures may be found in the Respiratory Protection Program.

## VII. Safety Equipment

Check the items that will be stationed on the project site:

| | | | |
|---|---|---|---|
| | Safety Showers | | Emergency Oxygen w/mask |
| X | Portable eyewash | X | First Aid Station |
| X | Barriers/Cones | | Fume Hood |
| | Warning Signs | | Grounding Rods |
| | Barrier Tape | | Lifeline/harness |
| | Decon Trailer | | Extraction device |
| | Lighting | | Ladders |
| | Ventilation | | Air Horns |
| | Ground/bonding cables | | |
| X | Fire extinguishers (types & sizes) | 5-10 lb ABC in vehicle | |
| | Spill Control Supplies (describe) | | |
| | Other Safety Items: | | |

## VIII. Communication Systems

Describe on-site communication systems: verbal communications & hand signals/cell phone

## IX. Monitoring Ambient Air Monitoring

The following equipment (check off appropriate ones and circle use) shall be used at intervals as specified:

| | | | | |
|---|---|---|---|---|
| | Radiation Meter | | Continuous/Hourly/2x Daily/Other | |
| | Combustible Gas/$O_2$ Meter | | Continuous/Hourly/2x Daily/Other | |
| | Colorimetric Tubes) | | Continuous/Hourly/2x Daily/Other | |
| | Photo-ionization Detector (type) | | Continuous/Hourly/2x Daily/Other | |
| | OVA/FID | | Continuous/Hourly/2x Daily/Other | |
| | $H_2S$ Monitor | | Continuous/Hourly/2x Daily/Other | |
| | CO Monitor | | Continuous/Hourly/2x Daily/Other | |
| | Dust Monitor (type) | | Continuous/Hourly/2x Daily/Other | |
| | Personal Monitors (list) | | Continuous/Hourly/2x Daily/Other | |
| | Other | | Continuous/Hourly/2x Daily/Other | |
| | Other | | Continuous/Hourly/2x Daily/Other | |

Methodology/Frequency

Calibration

***Note: Appendix D contains results of real-time air monitoring surveys.**

**Air Permits**

List of Air Permits required: N/A

**GUIDELINES FOR AIR MONITORING GASOLINE HAZARDS (1)**

| Monitoring Instruments | Hazards | Measured Level | Action |
|---|---|---|---|
| CGI-Combustible Gas Indicator (% Lower) Explosive Limit of combustible Gases | Explosive Atmosphere in immediate work area | < 10% LEL | Investigation with caution. |
| | | > 10% LEL | Explosion hazard.<br>Withdraw from area immediately. |
| GCI-Combustible Gas Indicator (Oxygen %) | Oxygen Concentration | < 19.5% | Monitor while wearing SCBA.<br>**Note:** combustible gas readings are not valid in atmospheres with < 19.5% Oxygen |
| | | 19.5 - 23.0% | Continue investigation with caution.<br>Discontinue investigation monitoring. Fire hazard potential. Consult H&S Coordinator. |
| | | > 23.0% | |
| Photoionization (Hnu)/Flame ionization (OVA) Meters<br><br>**Actions taken are based on sustained or frequent readings.** | Volatile Contaminants | Breathing Zone. Background to 100 ppm. | Level D Protection (2) |
| | | 100 to 300 ppm over background. | Level C Protection (2) |
| | | 300 to 500 ppm over background. | Level B Protection (2) |
| | | Over 500 ppm over background. | **Evaluate exposure source**<br>Consult H&S Coordinator |

**(1)** - Gasoline is used for this guideline based on its higher volatility.

**(2)** - Meter readings are not the sole criteria for selecting the level of protection. These are only generalized guidelines.

**XII. Hazardous Waste Operation Contingency Plan**

Generator's Name: Amphenol Corporation

Location, description and route to site: Travel South on I-65 to Interchange 90. Turn right (west) on SR 44 to Forscythe Street. Turn right (north) on Forscythe Street. Go to the "T" intersection and turn right (east) on Hamilton Avenue. The site is on the left. The entrance is on Hurricane Road.

Contact: Joe Bianchi (Amphenol Corporation)

Phone No:607.563.5940

Client Project Manager: Brad Gentry

Police: 911 or alternate number ( ) -

Fire: 911 or alternate number ( ) -

**Hospital Name**:Johnson County Memorial Hospital

Phone/Address/Route to: 317-736-3300; 1125 W. Jefferson Street, Franklin, IN. Go west on Hamilton Avenue to Forshythe Street. Turn left (south) on Forshythe Street to SR 44 (Jefferson Street). Turn right (west) on SR 44 and go through the town of Franklin, across US31, and the hospital will be on the south side of SR 44, approximately 1 mile west of US 31. Approximately 7-10 minutes from the site.

Contact:

Alternate Contact:

Ambulance: 911

Interplant Medical:

**Key Personnel:** Office Resources - Phone Numbers

| | |
|---|---|
| **IWM CONSULTING Office** | |
| **Hydrogeologist / Engineer: Chris Newell** | (317) 347-1111, Ext. 132 / Cell Phone (765) 729-4978 |
| **Project Manager: Brad Gentry** | (317) 347-1111, Ext. 123 / Cell Phone (317) 435-8877 |
| **Operations Manager:** | |
| **Office H&S Coordinator: Mandy Haynes** | (317) 347-1111, Ext. 136/ Cell Phone (317) 441-7839 |
| | |
| | |
| | |
| **Emergency Contact: Medical and Health** | (317) 642-8011 |
| **State Environmental Agency: IDEM – Harry Atkinson** | (317) 234-0347 |
| **Emergency Response 24 hour action hotline** | (317) 233-7745 |
| **Poison Information Center** | (800) 962-1253 |

**Emergency Information**

Has a copy of contingency plan been received by hospital listed? ☐ YES ☐ NO X N/A (Explain) Not required

Is it documented? ☐ YES ☐ NO X N/A (Explain) Not required

Has the hospital been notified of job site activities and chemical hazards? ☐ YES ☒ NO ☐ N/A (Explain) Not required

**Emergency Medical Provider Route Map:**

Attach a map with written directions to the hospital and local medical provider as part of Appendix E.

**Evacuation Rote/Emergency Equipment Station Map:**

Attach a site-specific map indicating evacuation route, location, and description of emergency safety equipment as part of Appendix A.

Evacuation Alarm Description: Verbal warning and hand signals to all personnel

Evacuation Route Description: To an area upwind of the problem area.

Assembly Area Description: Assemble at entrance to site if upwind of the problem area.

## HASP AND CONTINGENCY PLAN SIGN-OFF

Name: Mandy Haynes Date: August 30, 2018

Person who completed plan

Customer Name: Amphenol Corporation Job Site: Former Amphenol Facility 980 Hurricane Rd. Franklin, IN

All site personnel (employees and their subcontractors) have reviewed the attached HASP and Contingency Plan. This plan provides site personnel with an orientation to the job task including:

- X Site Overview
- X Emergency Response Procedures
- X Potential Physical & Health Hazards of on-site hazardous materials
- X PPE Requirements
- X Site Security
- ☐ Hazards of Confined Spaces
- ☐ Site-specific environmental regulatory requirements

All sub-contracted employees have also been provided a written work plan.

| Print Name | Signature | Date | Company Affiliation |
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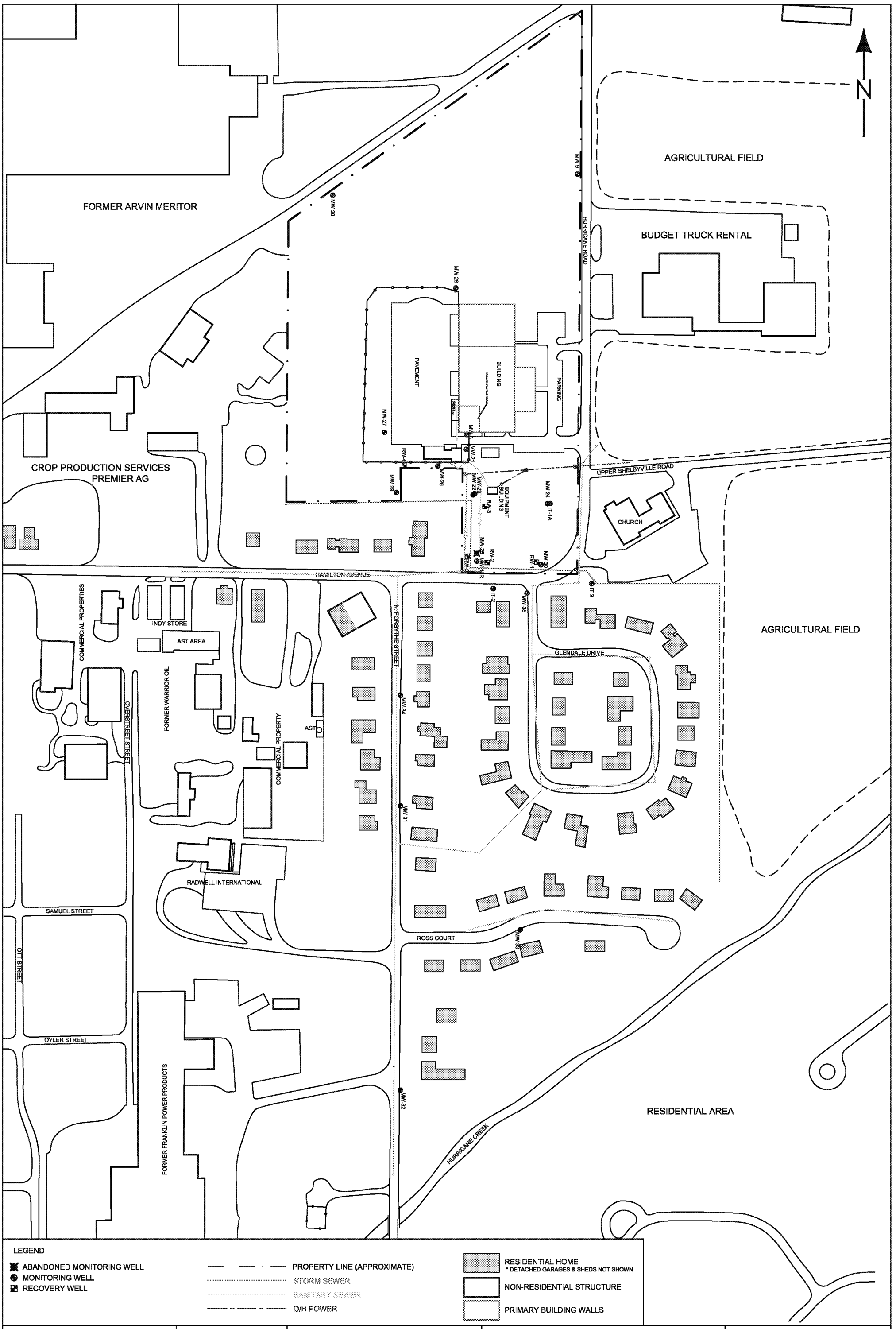
# APPENDIX A

# SITE MAPS

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|---|---|
| DRAWN BY: L. STRUM | |
| DATE: 9/27/99 | |
| REVISED: 08/29/2018 | |
| HWPA #111291-01 | |
| DWG. NO. 111291S1 | |

FIGURE 2

SITE MAP

FORMER AMPHENOL RFI/CMS
980 HURRICANE ROAD
FRANKLIN, INDIANA

IWM CONSULTING GROUP

# APPENDIX B

# JOB SAFETY ANALYSIS

**APPENDIX B**

# IWM CONSULTING

| |
|---|
| **Site Name:** Former Amphenol Facility |
| **Site Location: Franklin, IN** |
| **Address: 980 Hurricane Road** |
| **Date:** 8/30/2018 |

| Major Tasks/Activities | Hazards | Precautionary Measures/Controls |
|---|---|---|
| Groundwater Sampling | See Attached | See Attached |
| Soil Sampling | See Attached | See Attached |
| System O&M | See Attached | See Attached |
| Drilling | See Attached | See Attached |
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# Job Safety Analysis
## ***Groundwater Gauging & Sampling***

| Principal Steps | Potential Hazards | Recommended Controls |
|---|---|---|
| Groundwater Gauging | Auto Traffic | Follow Traffic Control SOP; wear Hi-Visibility safety vests; utilize buddy system; remain aware of surroundings. |
| | Dissolved hydrocarbons on the electronic water level indicator | Wear appropriate PPE. Utilize decon solutions to clean water level indicator of all hydrocarbons. |
| | Pinch (hand); debris (cuts/puncture); Biological | Use tools to open the well vault and clear wellhead area of debris liquids or biological hazards. Wear leather gloves while opening vault and clearing debris. |
| Groundwater Bailing | Exposure; Back Strain; Hand injury | Use even footing on firm ground. Avoid twisting body. Stand close to and over the well. Handle rope slowly, coil rope away from feet. |
| | Spill/Splash | Wear nitrile gloves and eye protection. |
| | Repetitive Stress | Ergonomics - adjust hand position to avoid repetitive motion. Take breaks. |
| | Bailer Lodged in Well | Do not use excessive force. Free bailer by dropping further into well and then pulling upwards. |
| | Slip, trip & fall; back strain | When transporting and disposing purge water, use proper lifting techniques and avoid twisting the body. |
| Groundwater Sampling | Breakage and acid | Work slowly and handle only one container at a time. Wear safety glasses and gloves. Inspect sample containers for cracks prior to handling and removing/installing the lid. Do not over tighten the sample container. |
| **Equipment to be Used** | **Inspection Requirements** | **Training Requirements** |
| Electronic Water Level Indicator | Inspect water level indicator to verify that there are no frayed wires or loose connections. | Not applicable |

# Job Safety Analysis
## ***Soil Sampling***

| Principal Steps | Potential Hazards | Recommended Controls |
|---|---|---|
| Work Zone Set-Up | Traffic | Traffic control (barricades and/ or cones) Face flow of traffic and use appropriate cones, flags, and/or tape per client and/or Handex protocols. Block off designated sampling area. |
| | Overhead utilities | Look up before setting up equipment, spotter |
| | Sharp debris in sample | Wear thick gloves |
| Excavation | Overhead, underground utilities | Look up/hand clear holes |
| | Noise | Ear plugs or ear muffs |
| | Debris | Hard hat, safety glasses, steel toes |
| Sample collection | Chemical contact with skin | Nitrile gloves |
| Clean Up | Traffic, slip trip fall, | See above. Be aware of surroundings and use good housekeeping methods. |
| | Weather | Pay attention to predicted and current weather conditions |
| | Hot weather | Drink plenty of fluids (preferably water and/or sports drinks) wear light colored clothing, take rest breaks when necessary |
| | Cold weather | Wear plenty of clothing, take breaks when necessary |
| | Severe weather Thunderstorms | Take shelter, lower any raised equipment, |
| | Tornado | Move inside building or vehicle, take appropriate shelter in building or ditch |
| **Equipment to be Used** | **Inspection Requirements** | **Training Requirements** |
| | | |

# Job Safety Analysis
## *System Operations & Maintenance*

| Principal Steps | Potential Hazards | Recommended Controls |
|---|---|---|
| Review H&S plan and don PPE | Neighborhood & weather conditions, traffic | Prepare away from traffic. If weather unsuitable for work then reschedule. Be aware of your surroundings, particularly when inside shed (may want to lock door behind you). |
| Open System Enclosure and/or Control Panel. | Slip, Trip, Fall, Electrical and Environmental Hazards | Wear proper PPE. Be aware of surroundings. Watch for insects or debris in enclosed spaces. |
| Check Air Compressor Operation | Pressurized vessels, high air pressure, electrical hazards, noise, moving parts. | Make sure guards are in place. Check oil, which may be hot. Reset starter or breakers if necessary. Record air pressure in tank. Inspect compression fittings for leaks, hoses and clamps for swelling/fit. |
| Check Oil/Water Separator | Contact with or exposure to site contaminants, lifting | Be aware of hydrocarbon vapors and liquid phase hydrocarbons when opening the separator. Use care when lifting separator lid. Check all floats and shutoffs for proper operation/clean. |
| Check Air Stripper and Air Stripper Blower Operation | Electrical hazards, noise, moving parts, contact with or exposure to site contaminants. | Make sure guards are in place. Reset starter or breakers if necessary. Record air pressure in stripper. Adjust airflow as necessary. Check piping and gaskets for air and/or water leaks. |
| Check Transfer Pump Operation | Electrical hazards, noise, moving parts, contact with or exposure to site contaminants. | Check for water leaks in piping into/out of the pump. Reset starter or breakers, if necessary. Check/clean probes. |
| Examine Liquid Carbon Treatment Vessels | Pressurized vessel, contact with or exposure to site contaminants. | Check for water leaks in piping into/out of each vessel and repair, as necessary. Record vessel pressures/backflush to reduce to normal range. Check vacuum breaker, hoses, etc. (if not hard piped). Check vessels for pinhole leaks/gaskets at ports, etc. |
| Check Soil Vapor Extraction Blower Operation | Electrical hazards, noise, moving parts, contact with or exposure to site contaminants. | Make sure guards are in place. Reset starter or breakers, if necessary. Record vacuum. Check oil level, as necessary. |
| Check Vapor Carbon Treatment Vessels | Pressurized vessel, contact with or exposure to site contaminants. | Check for air leaks in piping into/out of each vessel as repair, as necessary. Check high temperature shutoff. |
| Check Sparge Compressor Operation | Electrical hazards, noise, moving parts, high air pressure, contact with or exposure to site | Check for air leaks in piping. Adjust air pressure/flow, as necessary. Reset starter/breaker, as necessary. |

Job Safety Analysis
***System Operations & Maintenance***

| | | |
|---|---|---|
| | contaminants. Heat. | Record pressure and flow rate. Check shutoff. |
| Collection of System Water Samples | Contact with or exposure to site contaminants | Work slowly. Handle one container at a time. Wear safety glasses and gloves. Maintain traffic control and awareness. |
| Collection of System Vapor Samples | Contact with or exposure to site contaminants | Work slowly. Handle one container and sample pump/diver's box at a time. Wear safety glasses and gloves. Maintain traffic control and awareness. Close control panel and system enclosure. |
| **Equipment to be Used** | **Inspection Requirements** | **Training Requirements** |
| Magnehelic gauge, air flow (Kurz meter) | Proper working condition | Field training |

# Job Safety Analysis
## ***Drilling/Well Installation***

| Principal Steps | Potential Hazards | Recommended Controls |
|---|---|---|
| Review H&S plan and put on PPE | Neighborhood and weather conditions, traffic | Prepare away from traffic. If weather is unsuitable for work then reschedule. Be aware of your surroundings. |
| Establish traffic controls | Auto traffic | Block Entrances |
| Make sure that utilities are marked and disconnected | Explosion, electrocution | If utilities are not marked, call in for immediate marking. |
| Perform Push Probe Soil Sampling | See Soil Sampling/Push Probe Sampling JSA | See Soil Sampling/Push Probe Sampling JSA: Follow Subsurface Disturbance Protocol |
| Perform Well Installation | Lifting Injuries, Hand Abrasions; Injuries From Equipment – Turning Augers; Loose clothing, lack of gloves, eye protection; equipment position; Falling trees, brush, slip trip fall, poison ivy. | Determine the perimeter with ground crew. Maintain eye protection, hand protection hard hat and steel toe boot requirements. All personnel must maintain proper clearance during drilling activities.<br>Maintain proper clearance from swing radius. Operator and ground crew must be diligent of each other. Work slowly. Operator must face in the direction that the drill rig is moving. Ground personnel must stay out of the forward and reverse paths of the drill rig while moving. No one can approach the drill rig without acknowledgement from the operator. No one is to approach the drill rig while out of view of the operator. |
| Housekeeping | Auto traffic and drill rig, and pinch hazard for hands, debris, abrasions from debris, slip, trip and fall, back strain | Handle one container at a time. Wear safety glasses, steel toed boots, and gloves. Maintain traffic control and awareness. Work deliberately. Do not overexert yourself when lifting. |
| Installation of well tops and manholes. | Auto traffic and pinch hazard for hands and feet. | Maintain traffic control and awareness. Methodically seal off and lock well head. Place, lock and bolt down manhole covers. |
| Prepare field reports | Auto traffic and neighborhood conditions. | Complete paperwork in vehicle and away from traffic area. Maintain neighborhood awareness. |
| Staging Drums | Equipment injury, Back Injury, Foot injury, Hand Injury | |

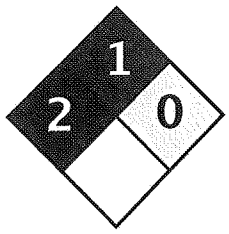
Job Safety Analysis
***Drilling/Well Installation***

| | | |
|---|---|---|
| **Equipment to be Used** | **Inspection Requirements** | **Training Requirements** |
| Drill Rig/Push Probe Sampler | Check hydraulics for leaks. Check condition of tracks. Check controls for proper operation. Emergency Shut offs | |
| Lifting cables or straps | Make sure it has sufficient load rating to carry the object; Inspect for frays prior to use | |

# APPENDIX C

# MATERIAL SAFETY DATA SHEETS

ScienceLab.com
Chemicals & Laboratory Equipment




| | |
|---|---|
| Health | 2 |
| Fire | 1 |
| Reactivity | 0 |
| Personal Protection | H |

# Material Safety Data Sheet
## Trichloroethylene MSDS

### Section 1: Chemical Product and Company Identification

**Product Name:** Trichloroethylene

**Catalog Codes:** SLT3310, SLT2590

**CAS#:** 79-01-6

**RTECS:** KX4560000

**TSCA:** TSCA 8(b) inventory: Trichloroethylene

**CI#:** Not available.

**Synonym:**

**Chemical Formula:** C2HCl3

**Contact Information:**

**Sciencelab.com, Inc.**
14025 Smith Rd.
Houston, Texas 77396

US Sales: **1-800-901-7247**
International Sales: **1-281-441-4400**

Order Online: ScienceLab.com

**CHEMTREC (24HR Emergency Telephone), call:**
1-800-424-9300

**International CHEMTREC, call:** 1-703-527-3887

**For non-emergency assistance, call:** 1-281-441-4400

### Section 2: Composition and Information on Ingredients

**Composition:**

| Name | CAS # | % by Weight |
|---|---|---|
| Trichloroethylene | 79-01-6 | 100 |

**Toxicological Data on Ingredients:** Trichloroethylene: ORAL (LD50): Acute: 5650 mg/kg [Rat]. 2402 mg/kg [Mouse]. DERMAL (LD50): Acute: 20001 mg/kg [Rabbit].

### Section 3: Hazards Identification

**Potential Acute Health Effects:** Hazardous in case of skin contact (irritant, permeator), of eye contact (irritant), of ingestion, of inhalation.

**Potential Chronic Health Effects:**
CARCINOGENIC EFFECTS: Classified + (PROVEN) by OSHA. Classified A5 (Not suspected for human.) by ACGIH.
MUTAGENIC EFFECTS: Not available.
TERATOGENIC EFFECTS: Not available.
DEVELOPMENTAL TOXICITY: Not available.
The substance is toxic to kidneys, the nervous system, liver, heart, upper respiratory tract.
Repeated or prolonged exposure to the substance can produce target organs damage.

### Section 4: First Aid Measures

**Eye Contact:**
Check for and remove any contact lenses. Immediately flush eyes with running water for at least 15 minutes, keeping eyelids open. Cold water may be used. Do not use an eye ointment. Seek medical attention.

**Skin Contact:**
After contact with skin, wash immediately with plenty of water. Gently and thoroughly wash the contaminated skin with running water and non-abrasive soap. Be particularly careful to clean folds, crevices, creases and groin. Cover the irritated skin with an emollient. If irritation persists, seek medical attention. Wash contaminated clothing before reusing.

**Serious Skin Contact:**
Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek medical attention.

**Inhalation:** Allow the victim to rest in a well ventilated area. Seek immediate medical attention.

**Serious Inhalation:**
Evacuate the victim to a safe area as soon as possible. Loosen tight clothing such as a collar, tie, belt or waistband. If breathing is difficult, administer oxygen. If the victim is not breathing, perform mouth-to-mouth resuscitation. Seek medical attention.

**Ingestion:**
Do not induce vomiting. Loosen tight clothing such as a collar, tie, belt or waistband. If the victim is not breathing, perform mouth-to-mouth resuscitation. Seek immediate medical attention.

**Serious Ingestion:** Not available.

## Section 5: Fire and Explosion Data

**Flammability of the Product:** May be combustible at high temperature.

**Auto-Ignition Temperature:** 420°C (788°F)

**Flash Points:** Not available.

**Flammable Limits:** LOWER: 8% UPPER: 10.5%

**Products of Combustion:** These products are carbon oxides (CO, CO2), halogenated compounds.

**Fire Hazards in Presence of Various Substances:** Not available.

**Explosion Hazards in Presence of Various Substances:**
Risks of explosion of the product in presence of mechanical impact: Not available.
Risks of explosion of the product in presence of static discharge: Not available.

**Fire Fighting Media and Instructions:**
SMALL FIRE: Use DRY chemical powder.
LARGE FIRE: Use water spray, fog or foam. Do not use water jet.

**Special Remarks on Fire Hazards:** Not available.

**Special Remarks on Explosion Hazards:** Not available.

## Section 6: Accidental Release Measures

**Small Spill:** Absorb with an inert material and put the spilled material in an appropriate waste disposal.

**Large Spill:**
Absorb with an inert material and put the spilled material in an appropriate waste disposal. Be careful that the

product is not present at a concentration level above TLV. Check TLV on the MSDS and with local authorities.

## Section 7: Handling and Storage

**Precautions:**
Keep locked up Keep away from heat. Keep away from sources of ignition. Empty containers pose a fire risk, evaporate the residue under a fume hood. Ground all equipment containing material. Do not ingest. Do not breathe gas/fumes/ vapour/spray. Wear suitable protective clothing In case of insufficient ventilation, wear suitable respiratory equipment If ingested, seek medical advice immediately and show the container or the label. Avoid contact with skin and eyes

**Storage:**
Keep container dry. Keep in a cool place. Ground all equipment containing material. Carcinogenic, teratogenic or mutagenic materials should be stored in a separate locked safety storage cabinet or room.

## Section 8: Exposure Controls/Personal Protection

**Engineering Controls:**
Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.

**Personal Protection:**
Splash goggles. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.

**Personal Protection in Case of a Large Spill:**
Splash goggles. Full suit. Vapor respirator. Boots. Gloves. A self contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

**Exposure Limits:**
TWA: 50 STEL: 200 (ppm) from ACGIH (TLV)
TWA: 269 STEL: 1070 (mg/m3) from ACGIH
Consult local authorities for acceptable exposure limits.

## Section 9: Physical and Chemical Properties

**Physical state and appearance:** Liquid.

**Odor:** Not available.

**Taste:** Not available.

**Molecular Weight:** 131.39 g/mole

**Color:** Clear Colorless.

**pH (1% soln/water):** Not available.

**Boiling Point:** 86.7°C (188.1°F)

**Melting Point:** -87.1°C (-124.8°F)

**Critical Temperature:** Not available.

**Specific Gravity:** 1.4649 (Water = 1)

**Vapor Pressure:** 58 mm of Hg (@ 20°C)

**Vapor Density:** 4.53 (Air = 1)

**Volatility:** Not available.

**Odor Threshold:** 20 ppm

**Water/Oil Dist. Coeff.:** The product is equally soluble in oil and water; log(oil/water) = 0

**Ionicity (in Water):** Not available.

**Dispersion Properties:** See solubility in water, methanol, diethyl ether, acetone.

**Solubility:**
Easily soluble in methanol, diethyl ether, acetone.
Very slightly soluble in cold water.

## Section 10: Stability and Reactivity Data

**Stability:** The product is stable.

**Instability Temperature:** Not available.

**Conditions of Instability:** Not available.

**Incompatibility with various substances:** Not available.

**Corrosivity:**
Extremely corrosive in presence of aluminum.
Non-corrosive in presence of glass.

**Special Remarks on Reactivity:** Not available.

**Special Remarks on Corrosivity:** Not available.

**Polymerization:** No.

## Section 11: Toxicological Information

**Routes of Entry:** Dermal contact. Eye contact. Inhalation. Ingestion.

**Toxicity to Animals:**
Acute oral toxicity (LD50): 2402 mg/kg [Mouse].
Acute dermal toxicity (LD50): 20001 mg/kg [Rabbit].

**Chronic Effects on Humans:**
CARCINOGENIC EFFECTS: Classified + (PROVEN) by OSHA. Classified A5 (Not suspected for human.) by ACGIH.
The substance is toxic to kidneys, the nervous system, liver, heart, upper respiratory tract.

**Other Toxic Effects on Humans:** Hazardous in case of skin contact (irritant, permeator), of ingestion, of inhalation.

**Special Remarks on Toxicity to Animals:** Not available.

**Special Remarks on Chronic Effects on Humans:** Passes through the placental barrier in human. Detected in maternal milk in human.

**Special Remarks on other Toxic Effects on Humans:** Not available.

## Section 12: Ecological Information

**Ecotoxicity:** Not available.

**BOD5 and COD:** Not available.

**Products of Biodegradation:**
Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.

**Toxicity of the Products of Biodegradation:** The products of degradation are more toxic.

**Special Remarks on the Products of Biodegradation:** Not available.

## Section 13: Disposal Considerations

**Waste Disposal:**

## Section 14: Transport Information

**DOT Classification:** CLASS 6.1: Poisonous material.

**Identification:** : Trichloroethylene : UN1710 PG: III

**Special Provisions for Transport:** Not available.

## Section 15: Other Regulatory Information

**Federal and State Regulations:**
California prop. 65: This product contains the following ingredients for which the State of California has found to cause cancer, birth defects or other reproductive harm, which would require a warning under the statute: Trichloroethylene
California prop. 65: This product contains the following ingredients for which the State of California has found to cause cancer which would require a warning under the statute: Trichloroethylene
Pennsylvania RTK: Trichloroethylene
Florida: Trichloroethylene
Minnesota: Trichloroethylene
Massachusetts RTK: Trichloroethylene
New Jersey: Trichloroethylene
TSCA 8(b) inventory: Trichloroethylene
CERCLA: Hazardous substances.: Trichloroethylene

**Other Regulations:** OSHA: Hazardous by definition of Hazard Communication Standard (29 CFR 1910.1200).

**Other Classifications:**

**WHMIS (Canada):**
CLASS D-1B: Material causing immediate and serious toxic effects (TOXIC).
CLASS D-2B: Material causing other toxic effects (TOXIC).

**DSCL (EEC):**
R36/38- Irritating to eyes and skin.
R45- May cause cancer.

**HMIS (U.S.A.):**

**Health Hazard:** 2

**Fire Hazard:** 1

**Reactivity:** 0

**Personal Protection:** h

**National Fire Protection Association (U.S.A.):**

**Health:** 2

**Flammability:** 1

**Reactivity:** 0

**Specific hazard:**

**Protective Equipment:**
Gloves.
Lab coat.
Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Wear appropriate respirator when ventilation is inadequate.
Splash goggles.

## Section 16: Other Information

**References:** Not available.

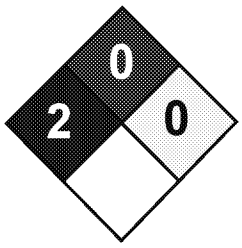
**Other Special Considerations:** Not available.

**Created:** 10/10/2005 08:54 PM

**Last Updated:** 10/10/2005 08:54 PM

*The information above is believed to be accurate and represents the best information currently available to us. However, we make no warranty of merchantability or any other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes. In no event shall ScienceLab.com be liable for any claims, losses, or damages of any third party or for lost profits or any special, indirect, incidental, consequential or exemplary damages, howsoever arising, even if ScienceLab.com has been advised of the possibility of such damages.*

ScienceLab.com
Chemicals & Laboratory Equipment




| | |
|---|---|
| Health | 2 |
| Fire | 0 |
| Reactivity | 0 |
| Personal Protection | G |

# Material Safety Data Sheet
## Tetrachloroethylene MSDS

## Section 1: Chemical Product and Company Identification

**Product Name:** Tetrachloroethylene

**Catalog Codes:** SLT3220

**CAS#:** 127-18-4

**RTECS:** KX3850000

**TSCA:** TSCA 8(b) inventory: Tetrachloroethylene

**CI#:** Not available.

**Synonym:** Perchloroethylene; 1,1,2,2-Tetrachloroethylene; Carbon bichloride; Carbon dichloride; Ankilostin; Didakene; Dilatin PT; Ethene, tetrachloro-; Ethylene tetrachloride; Perawin; Perchlor; Perclene; Perclene D; Percosolvel; Tetrachloroethene; Tetraleno; Tetralex; Tetravec; Tetroguer; Tetropil

**Chemical Name:** Ethylene, tetrachloro-

**Chemical Formula:** C2-Cl4

**Contact Information:**

**Sciencelab.com, Inc.**
14025 Smith Rd.
Houston, Texas 77396

US Sales: **1-800-901-7247**
International Sales: **1-281-441-4400**

Order Online: ScienceLab.com

**CHEMTREC (24HR Emergency Telephone), call:** 1-800-424-9300

**International CHEMTREC, call:** 1-703-527-3887

**For non-emergency assistance, call:** 1-281-441-4400

## Section 2: Composition and Information on Ingredients

**Composition:**

| Name | CAS # | % by Weight |
|---|---|---|
| Tetrachloroethylene | 127-18-4 | 100 |

**Toxicological Data on Ingredients:** Tetrachloroethylene: ORAL (LD50): Acute: 2629 mg/kg [Rat]. DERMAL (LD): Acute: >3228 mg/kg [Rabbit]. MIST(LC50): Acute: 34200 mg/m 8 hours [Rat]. VAPOR (LC50 ): Acute: 5200 ppm 4 hours [Mouse].

## Section 3: Hazards Identification

**Potential Acute Health Effects:**
Hazardous in case of skin contact (irritant), of inhalation. Slightly hazardous in case of skin contact (permeator), of eye contact (irritant), of ingestion.

**Potential Chronic Health Effects:**
CARCINOGENIC EFFECTS: Classified A3 (Proven for animal.) by ACGIH. Classified 2A (Probable for human.) by IARC, 2 (anticipated carcinogen) by NTP. MUTAGENIC EFFECTS: Mutagenic for bacteria and/or yeast. TERATOGENIC EFFECTS: Not available. DEVELOPMENTAL TOXICITY: Not available. The substance may be toxic to kidneys, liver, peripheral nervous system, respiratory tract, skin, central nervous system (CNS). Repeated or prolonged exposure to the substance can produce target organs damage.

## Section 4: First Aid Measures

**Eye Contact:**
Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Get medical attention if irritation occurs.

**Skin Contact:**
In case of contact, immediately flush skin with plenty of water. Cover the irritated skin with an emollient. Remove contaminated clothing and shoes. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention.

**Serious Skin Contact:**
Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek medical attention.

**Inhalation:**
If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention if symptoms appear.

**Serious Inhalation:**
Evacuate the victim to a safe area as soon as possible. Loosen tight clothing such as a collar, tie, belt or waistband. If breathing is difficult, administer oxygen. If the victim is not breathing, perform mouth-to-mouth resuscitation. Seek medical attention.

**Ingestion:**
Do NOT induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention if symptoms appear.

**Serious Ingestion:** Not available.

## Section 5: Fire and Explosion Data

**Flammability of the Product:** Non-flammable.

**Auto-Ignition Temperature:** Not applicable.

**Flash Points:** Not applicable.

**Flammable Limits:** Not applicable.

**Products of Combustion:** Not available.

**Fire Hazards in Presence of Various Substances:** Not applicable.

**Explosion Hazards in Presence of Various Substances:**
Risks of explosion of the product in presence of mechanical impact: Not available. Risks of explosion of the product in presence of static discharge: Not available.

**Fire Fighting Media and Instructions:** Not applicable.

**Special Remarks on Fire Hazards:** Not available.

**Special Remarks on Explosion Hazards:** Not available.

## Section 6: Accidental Release Measures

**Small Spill:** Absorb with an inert material and put the spilled material in an appropriate waste disposal.

**Large Spill:**
Absorb with an inert material and put the spilled material in an appropriate waste disposal. Be careful that the product is not present at a concentration level above TLV. Check TLV on the MSDS and with local authorities.

## Section 7: Handling and Storage

**Precautions:**
Do not ingest. Do not breathe gas/fumes/ vapor/spray. Avoid contact with skin. Wear suitable protective clothing. In case of insufficient ventilation, wear suitable respiratory equipment. If ingested, seek medical advice immediately and show the container or the label. Keep away from incompatibles such as oxidizing agents, metals, acids, alkalis.

**Storage:** Keep container tightly closed. Keep container in a cool, well-ventilated area.

## Section 8: Exposure Controls/Personal Protection

**Engineering Controls:**
Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value.

**Personal Protection:**
Safety glasses. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.

**Personal Protection in Case of a Large Spill:**
Splash goggles. Full suit. Vapor respirator. Boots. Gloves. A self contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

**Exposure Limits:**
TWA: 25 (ppm) from OSHA (PEL) [United States] TWA: 25 STEL: 100 (ppm) from ACGIH (TLV) [United States] TWA: 170 (mg/m3) from OSHA (PEL) [United States] Consult local authorities for acceptable exposure limits.

## Section 9: Physical and Chemical Properties

**Physical state and appearance:** Liquid.

**Odor:** Ethereal.

**Taste:** Not available.

**Molecular Weight:** 165.83 g/mole

**Color:** Clear Colorless.

**pH (1% soln/water):** Not available.

**Boiling Point:** 121.3°C (250.3°F)

**Melting Point:** -22.3°C (-8.1°F)

**Critical Temperature:** 347.1°C (656.8°F)

**Specific Gravity:** 1.6227 (Water = 1)

**Vapor Pressure:** 1.7 kPa (@ 20°C)

**Vapor Density:** 5.7 (Air = 1)

**Volatility:** Not available.

**Odor Threshold:** 5 - 50 ppm

**Water/Oil Dist. Coeff.:** The product is more soluble in oil; log(oil/water) = 3.4

**Ionicity (in Water):** Not available.

**Dispersion Properties:** Not available.

**Solubility:**
Miscible with alcohol, ether, chloroform, benzene, hexane. It dissolves in most of the fixed and volatile oils. Solubility in water: 0.015 g/100 ml @ 25 deg. C It slowly decomposes in water to yield Trichloroacetic and Hydrochloric acids.

## Section 10: Stability and Reactivity Data

**Stability:** The product is stable.

**Instability Temperature:** Not available.

**Conditions of Instability:** Incompatible materials

**Incompatibility with various substances:** Reactive with oxidizing agents, metals, acids, alkalis.

**Corrosivity:** Non-corrosive in presence of glass.

**Special Remarks on Reactivity:**
Oxidized by strong oxidizing agents. Incompatible with sodium hydroxide, finely divided or powdered metals such as zinc, aluminum, magnesium, potassium, chemically active metals such as lithium, beryllium , barium. Protect from light.

**Special Remarks on Corrosivity:** Slowly corrodes aluminum, iron, and zinc.

**Polymerization:** Will not occur.

## Section 11: Toxicological Information

**Routes of Entry:** Absorbed through skin. Eye contact. Inhalation. Ingestion.

**Toxicity to Animals:**
WARNING: THE LC50 VALUES HEREUNDER ARE ESTIMATED ON THE BASIS OF A 4-HOUR EXPOSURE. Acute oral toxicity (LD50): 2629 mg/kg [Rat]. Acute dermal toxicity (LD50): >3228 mg/kg [Rabbit]. Acute toxicity of the vapor (LC50): 5200 4 hours [Mouse].

**Chronic Effects on Humans:**
CARCINOGENIC EFFECTS: Classified A3 (Proven for animal.) by ACGIH. Classified 2A (Probable for human.) by IARC, 2 (Some evidence.) by NTP. MUTAGENIC EFFECTS: Mutagenic for bacteria and/or yeast. May cause damage to the following organs: kidneys, liver, peripheral nervous system, upper respiratory tract, skin, central nervous system (CNS).

**Other Toxic Effects on Humans:**
Hazardous in case of skin contact (irritant), of inhalation. Slightly hazardous in case of skin contact (permeator), of ingestion.

**Special Remarks on Toxicity to Animals:**
Lowest Publishe Lethal Dose/Conc: LDL [Rabbit] - Route: Oral; Dose: 5000 mg/kg LDL [Dog] - Route: Oral; Dose: 4000 mg/kg LDL [Cat] - Route: Oral; Dose: 4000 mg/kg

**Special Remarks on Chronic Effects on Humans:**
May cause adverse reproductive effects and birth defects(teratogenic). May affect genetic material (mutagenic). May cause cancer.

**Special Remarks on other Toxic Effects on Humans:**
Acute Potential Health Effects: Skin: Causes skin irritation with possible dermal blistering or burns. Symtoms may include redness, itching, pain, and possible dermal blistering or burns. It may be absorbed through the skin with possible systemic effects. A single prolonged skin exposure is not likely to result in the material being absorbed in harmful amounts. Eyes: Contact causes transient eye irritation, lacrimation. Vapors cause eye/conjunctival irritation. Symptoms may include redness and pain. Inhalation: The main route to occupational exposure is by inhalation since it is readily absorbed through the lungs. It causes respiratory tract irritation, . It can affect behavior/central nervous system (CNS depressant and anesthesia ranging from slight inebriation to death, vertigo, somnolence, anxiety, headache, excitement, hallucinations, muscle incoordination, dizziness, lightheadness, disorentiation, seizures, enotional instability, stupor, coma). It may cause pulmonary edema Ingestion: It can cause nausea, vomiting, anorexia, diarrhea, bloody stool. It may affect the liver, urinary system (proteinuria, hematuria, renal failure, renal tubular disorder), heart (arrhythmias). It may affect behavior/central nervous system with symptoms similar to that of inhalation. Chronic Potential Health Effects: Skin: Prolonged or repeated skin contact may result in excessive drying of the skin, and irritation. Ingestion/Inhalation: Chronic exposure can affect the liver(hepatitis,fatty liver degeneration), kidneys, spleen, and heart (irregular heartbeat/arrhythmias, cardiomyopathy, abnormal EEG), brain, behavior/ central nervous system/peripheral nervous system (impaired memory, numbness of extremeties, peripheral neuropathy and other

## Section 12: Ecological Information

**Ecotoxicity:**
Ecotoxicity in water (LC50): 18.4 mg/l 96 hours [Fish (Fatthead Minnow)]. 18 mg/l 48 hours [Daphnia (daphnia)]. 5 mg/l 96 hours [Fish (Rainbow Trout)]. 13 mg/l 96 hours [Fish (Bluegill sunfish)].

**BOD5 and COD:** Not available.

**Products of Biodegradation:**
Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.

**Toxicity of the Products of Biodegradation:** The product itself and its products of degradation are not toxic.

**Special Remarks on the Products of Biodegradation:** Not available.

## Section 13: Disposal Considerations

**Waste Disposal:**
Waste must be disposed of in accordance with federal, state and local environmental control regulations.

## Section 14: Transport Information

**DOT Classification:** CLASS 6.1: Poisonous material.

**Identification:** : Tetrachloroethylene UNNA: 1897 PG: III

**Special Provisions for Transport:** Marine Pollutant

## Section 15: Other Regulatory Information

**Federal and State Regulations:**
California prop. 65: This product contains the following ingredients for which the State of California has found to cause cancer, birth defects or other reproductive harm, which would require a warning under the statute: Tetrachloroethylene California prop. 65: This product contains the following ingredients for which the State of California has found to cause cancer which would require a warning under the statute: Tetrachloroethylene Connecticut hazardous material survey.: Tetrachloroethylene Illinois toxic substances disclosure to employee act: Tetrachloroethylene Illinois chemical safety act: Tetrachloroethylene New York release reporting list: Tetrachloroethylene Rhode Island RTK hazardous substances: Tetrachloroethylene Pennsylvania RTK: Tetrachloroethylene Minnesota: Tetrachloroethylene Michigan critical material: Tetrachloroethylene Massachusetts RTK: Tetrachloroethylene Massachusetts spill list: Tetrachloroethylene New Jersey: Tetrachloroethylene New Jersey spill list: Tetrachloroethylene Louisiana spill reporting: Tetrachloroethylene California Director's List of Hazardous Substances: Tetrachloroethylene TSCA 8(b) inventory: Tetrachloroethylene TSCA 8(d) H and S data reporting: Tetrachloroethylene: Effective date: 6/1/87; Sunset date: 6/1/97 SARA 313 toxic chemical notification and release reporting: Tetrachloroethylene CERCLA: Hazardous substances.: Tetrachloroethylene: 100 lbs. (45.36 kg)

**Other Regulations:**
OSHA: Hazardous by definition of Hazard Communication Standard (29 CFR 1910.1200). EINECS: This product is on the European Inventory of Existing Commercial Chemical Substances.

**Other Classifications:**

**WHMIS (Canada):**
CLASS D-1B: Material causing immediate and serious toxic effects (TOXIC). CLASS D-2A: Material causing other toxic effects (VERY TOXIC).

**DSCL (EEC):**
R40- Possible risks of irreversible effects. R51/53- Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment. S23- Do not breathe gas/fumes/vapour/spray S26- In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. S37- Wear suitable gloves. S61- Avoid release to the environment. Refer to special instructions/Safety data sheets.

**HMIS (U.S.A.):**

**Health Hazard:** 2

**Fire Hazard:** 0

**Reactivity:** 0

**Personal Protection:** g

**National Fire Protection Association (U.S.A.):**

**Health:** 2

**Flammability:** 0

**Reactivity:** 0

**Specific hazard:**

**Protective Equipment:**
Gloves. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Wear appropriate respirator when ventilation is inadequate. Safety glasses.

## Section 16: Other Information

**References:** Not available.

**Other Special Considerations:** Not available.

**Created:** 10/10/2005 08:29 PM

**Last Updated:** 06/09/2012 12:00 PM

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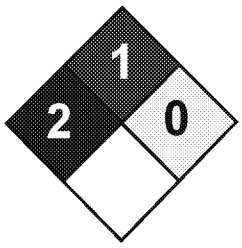


| | |
|---|---|
| Health | 2 |
| Fire | 1 |
| Reactivity | 0 |
| Personal Protection | H |

# Material Safety Data Sheet
# 1,1,1-Trichloroethane MSDS

## Section 1: Chemical Product and Company Identification

**Product Name:** 1,1,1-Trichloroethane

**Catalog Codes:**

**CAS#:** 71-55-6

**RTECS:** KJ2975000

**TSCA:** TSCA 8(b) inventory: 1,1,1-Trichloroethane

**CI#:** Not available.

**Synonym:**

**Chemical Formula:** CH3CCl3

**Contact Information:**

**Sciencelab.com, Inc.**
14025 Smith Rd.
Houston, Texas 77396

US Sales: **1-800-901-7247**
International Sales: **1-281-441-4400**

Order Online: ScienceLab.com

**CHEMTREC (24HR Emergency Telephone), call:** 1-800-424-9300

**International CHEMTREC, call:** 1-703-527-3887

**For non-emergency assistance, call:** 1-281-441-4400

## Section 2: Composition and Information on Ingredients

**Composition:**

| Name | CAS # | % by Weight |
|---|---|---|
| {1,1,1-}Trichloroethane | 71-55-6 | 100 |

**Toxicological Data on Ingredients:** 1,1,1-Trichloroethane: ORAL (LD50): Acute: 9600 mg/kg [Rat]. 6000 mg/kg [Mouse]. DERMAL (LD50): Acute: 15800 mg/kg [Rabbit]. VAPOR (LC50): Acute: 18000 ppm 4 hour(s) [Rat].

## Section 3: Hazards Identification

**Potential Acute Health Effects:**
Very hazardous in case of eye contact (irritant), of ingestion. Hazardous in case of skin contact (irritant, permeator), of inhalation. Inflammation of the eye is characterized by redness, watering, and itching.

**Potential Chronic Health Effects:**
CARCINOGENIC EFFECTS: Not available. MUTAGENIC EFFECTS: Not available. TERATOGENIC EFFECTS: Not available. DEVELOPMENTAL TOXICITY: Not available. The substance is toxic to lungs, the nervous system, liver, mucous membranes. Repeated or prolonged exposure to the substance can produce target organs damage.

## Section 4: First Aid Measures

**Eye Contact:**

Check for and remove any contact lenses. Immediately flush eyes with running water for at least 15 minutes, keeping eyelids open. Cold water may be used. Do not use an eye ointment. Seek medical attention.

**Skin Contact:**
After contact with skin, wash immediately with plenty of water. Gently and thoroughly wash the contaminated skin with running water and non-abrasive soap. Be particularly careful to clean folds, crevices, creases and groin. Cover the irritated skin with an emollient. If irritation persists, seek medical attention. Wash contaminated clothing before reusing.

**Serious Skin Contact:**
Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek medical attention.

**Inhalation:** Allow the victim to rest in a well ventilated area. Seek immediate medical attention.

**Serious Inhalation:**
Evacuate the victim to a safe area as soon as possible. Loosen tight clothing such as a collar, tie, belt or waistband. If breathing is difficult, administer oxygen. If the victim is not breathing, perform mouth-to-mouth resuscitation. Seek medical attention.

**Ingestion:**
Do not induce vomiting. Loosen tight clothing such as a collar, tie, belt or waistband. If the victim is not breathing, perform mouth-to-mouth resuscitation. Seek immediate medical attention.

**Serious Ingestion:** Not available.

## Section 5: Fire and Explosion Data

**Flammability of the Product:** May be combustible at high temperature.

**Auto-Ignition Temperature:** 537°C (998.6°F)

**Flash Points:** Not available.

**Flammable Limits:** LOWER: 7.5% UPPER: 12.5%

**Products of Combustion:** These products are carbon oxides (CO, CO2), halogenated compounds.

**Fire Hazards in Presence of Various Substances:** Slightly flammable to flammable in presence of oxidizing materials, of acids, of alkalis.

**Explosion Hazards in Presence of Various Substances:**
Risks of explosion of the product in presence of mechanical impact: Not available. Risks of explosion of the product in presence of static discharge: Not available. Slightly explosive to explosive in presence of oxidizing materials, of acids, of alkalis.

**Fire Fighting Media and Instructions:**
SMALL FIRE: Use DRY chemical powder. LARGE FIRE: Use water spray, fog or foam. Do not use water jet.

**Special Remarks on Fire Hazards:** Not available.

**Special Remarks on Explosion Hazards:** Not available.

## Section 6: Accidental Release Measures

**Small Spill:** Absorb with an inert material and put the spilled material in an appropriate waste disposal.

**Large Spill:**
Absorb with an inert material and put the spilled material in an appropriate waste disposal. Be careful that the product is not present at a concentration level above TLV. Check TLV on the MSDS and with local authorities.

## Section 7: Handling and Storage

**Precautions:**

Keep away from heat. Keep away from sources of ignition. Empty containers pose a fire risk, evaporate the residue under a fume hood. Ground all equipment containing material. Do not ingest. Do not breathe gas/fumes/ vapour/spray. In case of insufficient ventilation, wear suitable respiratory equipment If ingested, seek medical advice immediately and show the container or the label. Avoid contact with skin and eyes

**Storage:**
Keep container dry. Keep in a cool place. Ground all equipment containing material. Keep container tightly closed. Keep in a cool, well-ventilated place. Combustible materials should be stored away from extreme heat and away from strong oxidizing agents.

## Section 8: Exposure Controls/Personal Protection

**Engineering Controls:**
Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.

**Personal Protection:**
Splash goggles. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.

**Personal Protection in Case of a Large Spill:**
Splash goggles. Full suit. Vapor respirator. Boots. Gloves. A self contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

**Exposure Limits:**
TWA: 350 STEL: 440 CEIL: 440 (ppm) from ACGIH (TLV) [1995] TWA: 1900 STEL: 2460 CEIL: 2380 (mg/m3) from ACGIH [1995]Consult local authorities for acceptable exposure limits.

## Section 9: Physical and Chemical Properties

**Physical state and appearance:** Liquid.

**Odor:** Not available.

**Taste:** Not available.

**Molecular Weight:** 133.41 g/mole

**Color:** Not available.

**pH (1% soln/water):** Not available.

**Boiling Point:** 74.1°C (165.4°F)

**Melting Point:** -32.5°C (-26.5°F)

**Critical Temperature:** Not available.

**Specific Gravity:** 1.3376 (Water = 1)

**Vapor Pressure:** 100 mm of Hg (@ 20°C)

**Vapor Density:** 4.6 (Air = 1)

**Volatility:** Not available.

**Odor Threshold:** 400 ppm

**Water/Oil Dist. Coeff.:** The product is equally soluble in oil and water; log(oil/water) = 0

**Ionicity (in Water):** Not available.

**Dispersion Properties:** Not available.

**Solubility:** Very slightly soluble in cold water.

## Section 10: Stability and Reactivity Data

**Stability:** The product is stable.

**Instability Temperature:** Not available.

**Conditions of Instability:** Not available.

**Incompatibility with various substances:** Not available.

**Corrosivity:** Non-corrosive in presence of glass.

**Special Remarks on Reactivity:** Not available.

**Special Remarks on Corrosivity:** Not available.

**Polymerization:** No.

## Section 11: Toxicological Information

**Routes of Entry:** Dermal contact. Eye contact. Inhalation. Ingestion.

**Toxicity to Animals:**
WARNING: THE LC50 VALUES HEREUNDER ARE ESTIMATED ON THE BASIS OF A 4-HOUR EXPOSURE. Acute oral toxicity (LD50): 6000 mg/kg [Mouse]. Acute dermal toxicity (LD50): 15800 mg/kg [Rabbit]. Acute toxicity of the vapor (LC50): 18000 ppm 4 hour(s) [Rat].

**Chronic Effects on Humans:** The substance is toxic to lungs, the nervous system, liver, mucous membranes.

**Other Toxic Effects on Humans:**
Very hazardous in case of ingestion. Hazardous in case of skin contact (irritant, permeator), of inhalation.

**Special Remarks on Toxicity to Animals:** Not available.

**Special Remarks on Chronic Effects on Humans:** Detected in maternal milk in human.

**Special Remarks on other Toxic Effects on Humans:** Not available.

## Section 12: Ecological Information

**Ecotoxicity:** Not available.

**BOD5 and COD:** Not available.

**Products of Biodegradation:**
Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.

**Toxicity of the Products of Biodegradation:** The products of degradation are more toxic.

**Special Remarks on the Products of Biodegradation:** Not available.

## Section 13: Disposal Considerations

**Waste Disposal:**

## Section 14: Transport Information

**DOT Classification:** CLASS 6.1: Poisonous material.

**Identification:** : 1,1,1-Trichloroethane : UN2831 PG: III

**Special Provisions for Transport:** Not available.

## Section 15: Other Regulatory Information

**Federal and State Regulations:**
Pennsylvania RTK: 1,1,1-Trichloroethane Massachusetts RTK: 1,1,1-Trichloroethane TSCA 8(b) inventory: 1,1,1-Trichloroethane SARA 313 toxic chemical notification and release reporting: 1,1,1-Trichloroethane CERCLA: Hazardous substances.: 1,1,1-Trichloroethane

**Other Regulations:** OSHA: Hazardous by definition of Hazard Communication Standard (29 CFR 1910.1200).

**Other Classifications:**

**WHMIS (Canada):** CLASS D-1B: Material causing immediate and serious toxic effects (TOXIC).

**DSCL (EEC):**
R38- Irritating to skin. R41- Risk of serious damage to eyes.

**HMIS (U.S.A.):**

**Health Hazard:** 2

**Fire Hazard:** 1

**Reactivity:** 0

**Personal Protection:** h

**National Fire Protection Association (U.S.A.):**

**Health:** 2

**Flammability:** 1

**Reactivity:** 0

**Specific hazard:**

**Protective Equipment:**
Gloves. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Wear appropriate respirator when ventilation is inadequate. Splash goggles.

## Section 16: Other Information

**References:** Not available.

**Other Special Considerations:** Not available.

**Created:** 10/10/2005 08:31 PM

**Last Updated:** 05/21/2013 12:00 PM

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MATHESON TRI•GAS
ask. . .The Gas Professionals™



# MATERIAL SAFETY DATA SHEET

## 1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

**MATHESON TRI-GAS, INC.**
**150 Allen Road Suite 302**
**Basking Ridge, New Jersey 07920**
**Information: 1-800-416-2505**

**Emergency Contact:**
**CHEMTREC 1-800-424-9300**
**Calls Originating Outside the US:**
**703-527-3887 (Collect Calls Accepted)**

**SUBSTANCE: CIS-1,2-DICHLOROETHYLENE**

**TRADE NAMES/SYNONYMS:**
CIS-ACETYLENE DICHLORIDE; 1,2-DICHLOROETHYLENE; C2H2CL2; MAT05125; RTECS KV9420000

**CHEMICAL FAMILY:** halogenated, aliphatic

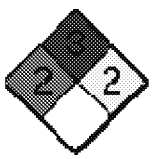
**CREATION DATE:** Jan 24 1989
**REVISION DATE:** Dec 11 2008

## 2. COMPOSITION, INFORMATION ON INGREDIENTS

**COMPONENT:** CIS-1,2-DICHLOROETHYLENE
**CAS NUMBER:** 156-59-2
**PERCENTAGE:** 100.0

## 3. HAZARDS IDENTIFICATION

**NFPA RATINGS (SCALE 0-4):** HEALTH=2 FIRE=3 REACTIVITY=2




**EMERGENCY OVERVIEW:**
**COLOR:** colorless
**PHYSICAL FORM:** liquid
**ODOR:** pleasant odor
**MAJOR HEALTH HAZARDS:** respiratory tract irritation, skin irritation, eye irritation, central nervous system depression
**PHYSICAL HAZARDS:** Flammable liquid and vapor. Vapor may cause flash fire. May react on contact with air, heat, light or water.

**POTENTIAL HEALTH EFFECTS:**
**INHALATION:**

**SHORT TERM EXPOSURE:** irritation, nausea, vomiting, drowsiness, symptoms of drunkenness
**LONG TERM EXPOSURE:** no information on significant adverse effects
**SKIN CONTACT:**
**SHORT TERM EXPOSURE:** irritation
**LONG TERM EXPOSURE:** same as effects reported in short term exposure
**EYE CONTACT:**
**SHORT TERM EXPOSURE:** irritation
**LONG TERM EXPOSURE:** same as effects reported in short term exposure
**INGESTION:**
**SHORT TERM EXPOSURE:** symptoms of drunkenness
**LONG TERM EXPOSURE:** no information on significant adverse effects

## 4. FIRST AID MEASURES

**INHALATION:** If adverse effects occur, remove to uncontaminated area. Give artificial respiration if not breathing. Get immediate medical attention.

**SKIN CONTACT:** Wash skin with soap and water for at least 15 minutes while removing contaminated clothing and shoes. Get medical attention, if needed. Thoroughly clean and dry contaminated clothing and shoes before reuse.

**EYE CONTACT:** Flush eyes with plenty of water for at least 15 minutes. Then get immediate medical attention.

**INGESTION:** If vomiting occurs, keep head lower than hips to help prevent aspiration. If person is unconscious, turn head to side. Get medical attention immediately.

**NOTE TO PHYSICIAN:** For ingestion, consider gastric lavage. Consider oxygen.

## 5. FIRE FIGHTING MEASURES

**FIRE AND EXPLOSION HAZARDS:** Severe fire hazard. Moderate explosion hazard. Vapor/air mixtures are explosive above flash point. The vapor is heavier than air. Vapors or gases may ignite at distant ignition sources and flash back.

**EXTINGUISHING MEDIA:** regular dry chemical, carbon dioxide, water, regular foam

Large fires: Use regular foam or flood with fine water spray.

**FIRE FIGHTING:** Move container from fire area if it can be done without risk. Cool containers with water spray until well after the fire is out. Stay away from the ends of tanks. For fires in cargo or storage area: Cool containers with water from unmanned hose holder or monitor nozzles until well after fire is out. If this is impossible then take the following precautions: Keep unnecessary people away, isolate hazard area and deny entry. Let the fire burn. Withdraw immediately in case of rising sound from venting safety device or any

discoloration of tanks due to fire. For tank, rail car or tank truck: Evacuation radius: 800 meters (1/2 mile). Do not attempt to extinguish fire unless flow of material can be stopped first. Flood with fine water spray. Do not scatter spilled material with high-pressure water streams. Cool containers with water spray until well after the fire is out. Apply water from a protected location or from a safe distance. Avoid inhalation of material or combustion by-products. Stay upwind and keep out of low areas. Water may be ineffective.

**FLASH POINT:** 39 F (4 C) (CC)
**LOWER FLAMMABLE LIMIT:** 9.7%
**UPPER FLAMMABLE LIMIT:** 12.8%
**FLAMMABILITY CLASS (OSHA):** IB

## 6. ACCIDENTAL RELEASE MEASURES

**OCCUPATIONAL RELEASE:**
Avoid heat, flames, sparks and other sources of ignition. Stop leak if possible without personal risk. Reduce vapors with water spray. Small spills: Absorb with sand or other non-combustible material. Collect spilled material in appropriate container for disposal. Large spills: Dike for later disposal. Remove sources of ignition. Keep unnecessary people away, isolate hazard area and deny entry.

## 7. HANDLING AND STORAGE

**STORAGE:** Store and handle in accordance with all current regulations and standards. Subject to storage regulations: U.S. OSHA 29 CFR 1910.106. Grounding and bonding required. Keep separated from incompatible substances.

## 8. EXPOSURE CONTROLS, PERSONAL PROTECTION

**EXPOSURE LIMITS:**
**CIS-1,2-DICHLOROETHYLENE:**
**1,2-DICHLOROETHYLENE (ALL ISOMERS):**
200 ppm (790 mg/m3) OSHA TWA
200 ppm ACGIH TWA
200 ppm (790 mg/m3) NIOSH recommended TWA 10 hour(s)

**VENTILATION:** Provide local exhaust ventilation system. Ventilation equipment should be explosion-resistant if explosive concentrations of material are present. Ensure compliance with applicable exposure limits.

**EYE PROTECTION:** Wear splash resistant safety goggles with a faceshield. Provide an emergency eye wash fountain and quick drench shower in the immediate work area.

**CLOTHING:** Wear appropriate chemical resistant clothing.

**GLOVES:** Wear appropriate chemical resistant gloves.

**RESPIRATOR:** The following respirators and maximum use concentrations are drawn from NIOSH and/or OSHA.
2000 ppm
Any supplied-air respirator operated in a continuous-flow mode.
Any powered, air-purifying respirator with organic vapor cartridge(s).
Any air-purifying respirator with a full facepiece and an organic vapor canister.
Any air-purifying full-facepiece respirator (gas mask) with a chin-style, front-mounted or back-mounted organic vapor canister.
Any self-contained breathing apparatus with a full facepiece.
Any supplied-air respirator with a full facepiece.
Emergency or planned entry into unknown concentrations or IDLH conditions -
Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode.
Any supplied-air respirator with a full facepiece that is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained breathing apparatus operated in pressure-demand or other positive-pressure mode.
**Escape -**
Any air-purifying full-facepiece respirator (gas mask) with a chin-style, front-mounted or back-mounted organic vapor canister.
Any appropriate escape-type, self-contained breathing apparatus.
**For Unknown Concentrations or Immediately Dangerous to Life or Health -**
Any supplied-air respirator with a full facepiece that is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained breathing apparatus operated in pressure-demand or other positive-pressure mode.
Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode.

## 9. PHYSICAL AND CHEMICAL PROPERTIES

**PHYSICAL STATE:** liquid
**COLOR:** colorless
**ODOR:** pleasant odor
**MOLECULAR WEIGHT:** 96.94
**MOLECULAR FORMULA:** C2-H2-CL2
**BOILING POINT:** 140 F (60 C)
**FREEZING POINT:** -114 F (-81 C)
**VAPOR PRESSURE:** 400 mmHg @ 41 C
**VAPOR DENSITY (air=1):** 3.34
**SPECIFIC GRAVITY (water=1):** 1.2837
**WATER SOLUBILITY:** insoluble
**PH:** Not available
**VOLATILITY:** Not available
**ODOR THRESHOLD:** Not available
**EVAPORATION RATE:** Not available

**COEFFICIENT OF WATER/OIL DISTRIBUTION:** Not available
**SOLVENT SOLUBILITY:**
**Soluble:** acetone, benzene, ether, alcohol

## 10. STABILITY AND REACTIVITY

**REACTIVITY:** May decompose on contact with air, light, moisture, heat or storage and use above room temperature. Releases toxic, corrosive, flammable or explosive gases.

**CONDITIONS TO AVOID:** Avoid heat, flames, sparks and other sources of ignition. Containers may rupture or explode if exposed to heat. Keep out of water supplies and sewers.

**INCOMPATIBILITIES:** bases, metals, combustible materials, oxidizing materials, acids

**HAZARDOUS DECOMPOSITION:**
Thermal decomposition products: phosgene, halogenated compounds, oxides of carbon

**POLYMERIZATION:** May polymerize. Avoid contact with incompatible materials.

## 11. TOXICOLOGICAL INFORMATION

**CIS-1,2-DICHLOROETHYLENE:**
**TOXICITY DATA:** 13700 ppm inhalation-rat LC50
**LOCAL EFFECTS:**
Irritant: inhalation, skin, eye
**ACUTE TOXICITY LEVEL:**
Slightly Toxic: inhalation
**TARGET ORGANS:** central nervous system
**MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE:** respiratory disorders
**MUTAGENIC DATA:** Available.

## 12. ECOLOGICAL INFORMATION

Not available

## 13. DISPOSAL CONSIDERATIONS

Subject to disposal regulations: U.S. EPA 40 CFR 262. Hazardous Waste Number(s): D001. Dispose in accordance with all applicable regulations.

## 14. TRANSPORT INFORMATION


**U.S. DOT 49 CFR 172.101:**
**PROPER SHIPPING NAME:** 1,2-Dichloroethylene
**ID NUMBER:** UN1150
**HAZARD CLASS OR DIVISION:** 3
**PACKING GROUP:** II
**LABELING REQUIREMENTS:** 3

**CANADIAN TRANSPORTATION OF DANGEROUS GOODS:**
**SHIPPING NAME:** 1,2-Dichloroethylene
**UN NUMBER:** UN1150
**CLASS:** 3
**PACKING GROUP/CATEGORY:** II

## 15. REGULATORY INFORMATION

**U.S. REGULATIONS:**
**CERCLA SECTIONS 102a/103 HAZARDOUS SUBSTANCES (40 CFR 302.4):** Not regulated.

**SARA TITLE III SECTION 302 EXTREMELY HAZARDOUS SUBSTANCES (40 CFR 355 Subpart B):** Not regulated.

**SARA TITLE III SECTION 304 EXTREMELY HAZARDOUS SUBSTANCES (40 CFR 355 Subpart C):** Not regulated.

**SARA TITLE III SARA SECTIONS 311/312 HAZARDOUS CATEGORIES (40 CFR 370 Subparts B and C):**
ACUTE: Yes
CHRONIC: No
FIRE: Yes
REACTIVE: Yes
SUDDEN RELEASE: No

**SARA TITLE III SECTION 313 (40 CFR 372.65):**
**1,2-DICHLOROETHYLENE (ALL ISOMERS)**

**OSHA PROCESS SAFETY (29 CFR 1910.119):** Not regulated.

**STATE REGULATIONS:**
**California Proposition 65:** Not regulated.

**CANADIAN REGULATIONS:**
**WHMIS CLASSIFICATION:** BD2

**NATIONAL INVENTORY STATUS:**
**U.S. INVENTORY (TSCA):** Listed on inventory.

**TSCA 12(b) EXPORT NOTIFICATION:** Not listed.

**CANADA INVENTORY (DSL/NDSL):** Not determined.

## 16. OTHER INFORMATION



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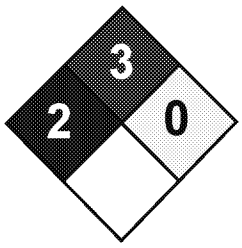
ScienceLab.com
Chemicals & Laboratory Equipment




| | |
|---|---|
| Health | 2 |
| Fire | 3 |
| Reactivity | 0 |
| Personal Protection | H |

# Material Safety Data Sheet
## 1,2-Dichloroethane MSDS

## Section 1: Chemical Product and Company Identification

**Product Name:** 1,2-Dichloroethane

**Catalog Codes:** SLD2521, SLD3721

**CAS#:** 107-06-2

**RTECS:** KH9800000

**TSCA:** TSCA 8(b) inventory: 1,2-Dichloroethane

**CI#:** Not available.

**Synonym:** Ethylene dichloride

**Chemical Formula:** C2H4CL2

**Contact Information:**

**Sciencelab.com, Inc.**
14025 Smith Rd.
Houston, Texas 77396

US Sales: **1-800-901-7247**
International Sales: **1-281-441-4400**

Order Online: ScienceLab.com

**CHEMTREC (24HR Emergency Telephone), call:** 1-800-424-9300

**International CHEMTREC, call:** 1-703-527-3887

**For non-emergency assistance, call:** 1-281-441-4400

## Section 2: Composition and Information on Ingredients

**Composition:**

| Name | CAS # | % by Weight |
|---|---|---|
| {1,2-}Dichloroethane | 107-06-2 | 100 |

**Toxicological Data on Ingredients:** 1,2-Dichloroethane: ORAL (LD50): Acute: 670 mg/kg [Rat]. 413 mg/kg [Mouse]. DERMAL (LD50): Acute: 2800 mg/kg [Rabbit]. VAPOR (LC50): Acute: 1414.2 ppm 4 hour(s) [Rat].

## Section 3: Hazards Identification

**Potential Acute Health Effects:**
Extremely hazardous in case of ingestion. Very hazardous in case of eye contact (irritant), of inhalation. Hazardous in case of skin contact (irritant). Corrosive to skin and eyes on contact. Liquid or spray mist may produce tissue damage particularly on mucous membranes of eyes, mouth and respiratory tract. Skin contact may produce burns. Inhalation of the spray mist may produce severe irritation of respiratory tract, characterized by coughing, choking, or shortness of breath. Inflammation of the eye is characterized by redness, watering, and itching.

**Potential Chronic Health Effects:**
Very hazardous in case of ingestion, of inhalation. CARCINOGENIC EFFECTS: Classified + (PROVEN) by OSHA. Classified 2B (Possible for human.) by IARC. Classified 2 (Reasonably anticipated.) by NTP. MUTAGENIC EFFECTS: Not available. TERATOGENIC EFFECTS: Not available. DEVELOPMENTAL TOXICITY: Not available. The substance is toxic to lungs, the nervous system, liver, mucous membranes. Repeated or prolonged exposure to the substance can produce target organs damage. Repeated or prolonged contact with spray mist may produce chronic eye irritation and severe skin irritation. Repeated or prolonged exposure to spray mist may produce respiratory tract irritation leading to frequent attacks of bronchial infection.

## Section 4: First Aid Measures

**Eye Contact:**
Check for and remove any contact lenses. Immediately flush eyes with running water for at least 15 minutes, keeping eyelids open. Cold water may be used. Do not use an eye ointment. Seek medical attention.

**Skin Contact:**
If the chemical got onto the clothed portion of the body, remove the contaminated clothes as quickly as possible, protecting your own hands and body. Place the victim under a deluge shower. If the chemical got on the victim's exposed skin, such as the hands : Gently and thoroughly wash the contaminated skin with running water and non-abrasive soap. Be particularly careful to clean folds, crevices, creases and groin. If irritation persists, seek medical attention. Wash contaminated clothing before reusing.

**Serious Skin Contact:**
Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek immediate medical attention.

**Inhalation:** Allow the victim to rest in a well ventilated area. Seek immediate medical attention.

**Serious Inhalation:**
Evacuate the victim to a safe area as soon as possible. Loosen tight clothing such as a collar, tie, belt or waistband. If breathing is difficult, administer oxygen. If the victim is not breathing, perform mouth-to-mouth resuscitation. WARNING: It may be hazardous to the person providing aid to give mouth-to-mouth resuscitation when the inhaled material is toxic, infectious or corrosive. Seek immediate medical attention.

**Ingestion:**
Do not induce vomiting. Examine the lips and mouth to ascertain whether the tissues are damaged, a possible indication that the toxic material was ingested; the absence of such signs, however, is not conclusive. Loosen tight clothing such as a collar, tie, belt or waistband. If the victim is not breathing, perform mouth-to-mouth resuscitation. Seek immediate medical attention.

**Serious Ingestion:** Not available.

## Section 5: Fire and Explosion Data

**Flammability of the Product:** Flammable.

**Auto-Ignition Temperature:** 413°C (775.4°F)

**Flash Points:** CLOSED CUP: 13°C (55.4°F). OPEN CUP: 18°C (64.4°F).

**Flammable Limits:** LOWER: 6.2% UPPER: 15.6%

**Products of Combustion:** These products are carbon oxides (CO, CO2).

**Fire Hazards in Presence of Various Substances:**
Flammable in presence of open flames and sparks. Slightly flammable to flammable in presence of oxidizing materials.

**Explosion Hazards in Presence of Various Substances:**
Risks of explosion of the product in presence of mechanical impact: Not available. Risks of explosion of the product in presence of static discharge: Not available. Slightly explosive to explosive in presence of oxidizing materials.

**Fire Fighting Media and Instructions:**
Flammable liquid, soluble or dispersed in water. SMALL FIRE: Use DRY chemical powder. LARGE FIRE: Use alcohol foam, water spray or fog.

**Special Remarks on Fire Hazards:** Not available.

**Special Remarks on Explosion Hazards:** Not available.

## Section 6: Accidental Release Measures

**Small Spill:** Absorb with an inert material and put the spilled material in an appropriate waste disposal.

**Large Spill:**
Flammable liquid. Corrosive liquid. Keep away from heat. Keep away from sources of ignition. Stop leak if without risk. Absorb with DRY earth, sand or other non-combustible material. Do not get water inside container. Do not touch spilled material. Use water spray curtain to divert vapor drift. Prevent entry into sewers, basements or confined areas; dike if needed. Eliminate all ignition sources. Call for assistance on disposal. Be careful that the product is not present at a concentration level above TLV. Check TLV on the MSDS and with local authorities.

## Section 7: Handling and Storage

**Precautions:**
Keep locked up Keep container dry. Keep away from heat. Keep away from sources of ignition. Ground all equipment containing material. Do not ingest. Do not breathe gas/fumes/ vapour/spray. Never add water to this product In case of insufficient ventilation, wear suitable respiratory equipment If ingested, seek medical advice immediately and show the container or the label. Avoid contact with skin and eyes

**Storage:**
Flammable materials should be stored in a separate safety storage cabinet or room. Keep away from heat. Keep away from sources of ignition. Keep container tightly closed. Keep in a cool, well-ventilated place. Ground all equipment containing material. A refrigerated room would be preferable for materials with a flash point lower than 37.8°C (100°F).

## Section 8: Exposure Controls/Personal Protection

**Engineering Controls:**
Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.

**Personal Protection:**
Splash goggles. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.

**Personal Protection in Case of a Large Spill:**
Splash goggles. Full suit. Vapor respirator. Boots. Gloves. A self contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

**Exposure Limits:**
TWA: 10 CEIL: 75 (ppm) from ACGIH (TLV) TWA: 40 CEIL: 300 (mg/m3) from ACGIHConsult local authorities for acceptable exposure limits.

## Section 9: Physical and Chemical Properties

**Physical state and appearance:** Liquid.

**Odor:** Not available.

**Taste:** Not available.

**Molecular Weight:** 98.96 g/mole

**Color:** Not available.

**pH (1% soln/water):** Not available.

**Boiling Point:** 83.5°C (182.3°F)

**Melting Point:** -35.3°C (-31.5°F)

**Critical Temperature:** Not available.

**Specific Gravity:** 1.2351 (Water = 1)

**Vapor Pressure:** 61 mm of Hg (@ 20°C)

**Vapor Density:** 3.42 (Air = 1)

**Volatility:** Not available.

**Odor Threshold:** 26 ppm

**Water/Oil Dist. Coeff.:** The product is equally soluble in oil and water; log(oil/water) = 0

**Ionicity (in Water):** Not available.

**Dispersion Properties:** See solubility in water, methanol, diethyl ether, n-octanol, acetone.

**Solubility:**
Easily soluble in methanol, diethyl ether, n-octanol, acetone. Very slightly soluble in cold water.

## Section 10: Stability and Reactivity Data

**Stability:** The product is stable.

**Instability Temperature:** Not available.

**Conditions of Instability:** Not available.

**Incompatibility with various substances:** Not available.

**Corrosivity:** Non-corrosive in presence of glass.

**Special Remarks on Reactivity:** Not available.

**Special Remarks on Corrosivity:** Not available.

**Polymerization:** No.

## Section 11: Toxicological Information

**Routes of Entry:** Eye contact. Inhalation. Ingestion.

**Toxicity to Animals:**
WARNING: THE LC50 VALUES HEREUNDER ARE ESTIMATED ON THE BASIS OF A 4-HOUR EXPOSURE. Acute oral toxicity (LD50): 413 mg/kg [Mouse]. Acute dermal toxicity (LD50): 2800 mg/kg [Rabbit]. Acute toxicity of the vapor (LC50): 1414.2 ppm 4 hour(s) [Rat].

**Chronic Effects on Humans:**
CARCINOGENIC EFFECTS: Classified + (PROVEN) by OSHA. Classified 2B (Possible for human.) by IARC. Classified 2 (Reasonably anticipated.) by NTP. The substance is toxic to lungs, the nervous system, liver, mucous membranes.

**Other Toxic Effects on Humans:**
Extremely hazardous in case of ingestion. Very hazardous in case of inhalation. Hazardous in case of skin contact (irritant).

**Special Remarks on Toxicity to Animals:** Not available.

**Special Remarks on Chronic Effects on Humans:** Passes through the placental barrier in animal. Excreted in maternal milk in human.

**Special Remarks on other Toxic Effects on Humans:** Not available.

## Section 12: Ecological Information

**Ecotoxicity:** Not available.

**BOD5 and COD:** Not available.

**Products of Biodegradation:**
Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.

**Toxicity of the Products of Biodegradation:** The products of degradation are more toxic.

**Special Remarks on the Products of Biodegradation:** Not available.

## Section 13: Disposal Considerations

**Waste Disposal:**

## Section 14: Transport Information

**DOT Classification:** Class 3: Flammable liquid.

**Identification:** : Ethylene dichloride : UN1184 PG: II

**Special Provisions for Transport:** Marine Pollutant

## Section 15: Other Regulatory Information

**Federal and State Regulations:**
California prop. 65: This product contains the following ingredients for which the State of California has found to cause cancer, birth defects or other reproductive harm, which would require a warning under the statute: 1,2-Dichloroethane California prop. 65: This product contains the following ingredients for which the State of California has found to cause cancer which would require a warning under the statute: 1,2-Dichloroethane Pennsylvania RTK: 1,2-Dichloroethane Massachusetts RTK: 1,2-Dichloroethane TSCA 8(b) inventory: 1,2-Dichloroethane CERCLA: Hazardous substances.: 1,2-Dichloroethane

**Other Regulations:** OSHA: Hazardous by definition of Hazard Communication Standard (29 CFR 1910.1200).

**Other Classifications:**

**WHMIS (Canada):**
CLASS B-2: Flammable liquid with a flash point lower than 37.8°C (100°F). CLASS D-1A: Material causing immediate and serious toxic effects (VERY TOXIC). CLASS D-2A: Material causing other toxic effects (VERY TOXIC). CLASS E: Corrosive liquid.

**DSCL (EEC):**
R11- Highly flammable. R20/22- Harmful by inhalation and if swallowed. R38- Irritating to skin. R41- Risk of serious damage to eyes. R45- May cause cancer.

**HMIS (U.S.A.):**

**Health Hazard:** 2

**Fire Hazard:** 3

**Reactivity:** 0

**Personal Protection:** h

**National Fire Protection Association (U.S.A.):**

**Health:** 2

**Flammability:** 3

**Reactivity:** 0

**Specific hazard:**

**Protective Equipment:**

Gloves. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Wear appropriate respirator when ventilation is inadequate. Splash goggles.

## Section 16: Other Information

**References:** Not available.

**Other Special Considerations:** Not available.

**Created:** 10/10/2005 08:17 PM

**Last Updated:** 05/21/2013 12:00 PM

*The information above is believed to be accurate and represents the best information currently available to us. However, we make no warranty of merchantability or any other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes. In no event shall ScienceLab.com be liable for any claims, losses, or damages of any third party or for lost profits or any special, indirect, incidental, consequential or exemplary damages, howsoever arising, even if ScienceLab.com has been advised of the possibility of such damages.*

# APPENDIX D

**MONITORING RESULTS**

| Instrument | Date/Time | Readings | Location |
|---|---|---|---|
| | | | |

# APPENDIX E

# SAFETY PLAN AMENDMENTS

# SAFETY PLAN AMENDMENTS

**Site Name:** Former Amphenol Facility **Start Date:** 8/30/2018 **End Date:** Ongoing

**Scope of Work/Change/Amendment/Update/Modification Made to the Plan:**

Commercial/Residential Vapor Intrusion (VI) Sampling, Outside Ambient Air Sampling, Sewer Gas Sampling which will involve accessing manholes and private Sewer lateral cleanouts, and soil gas sampling

**Reason for Amendment:** Potential for VI onsite and/or in the area surrounding the Site

**Hazard Evaluation:** Slip, trip, and fall hazard / Auto traffic - Safety cones and signage should be utilized when working within the roadway or right-of-way. No confined space entry is required (no entry into the sewer) / using installation equipment safely (punctures, electricity usage, dust) / careful removal and replacement of the manhole covers (pinching and dropping on extremities)

**Level of Protection:** Level D protection which includes: safety glasses (may not apply if working within a residence or in an area with no eye hazards Present), hard hat (if overhead hazards present), outer layer nitrile gloves (if sampling), leather steel toe boots (may not apply if working inside a residence), high visibility shirt or vest if working in the road way, leather gloves (if removing manhole covers).

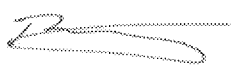
**Air Monitoring:** No air monitoring is required

**Person Requesting Amendment:**

Brad Gentry
(Name)

Vice President/Brownfield Coordinator
(Title)

8/30/2018
(Date)



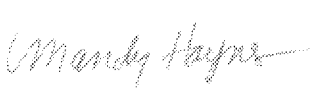
(Signature)

**Approval:**

Mandy Haynes
(Name)

Mandy Haynes
(H&S Director)

8/30/2018
(Date)



(Signature)

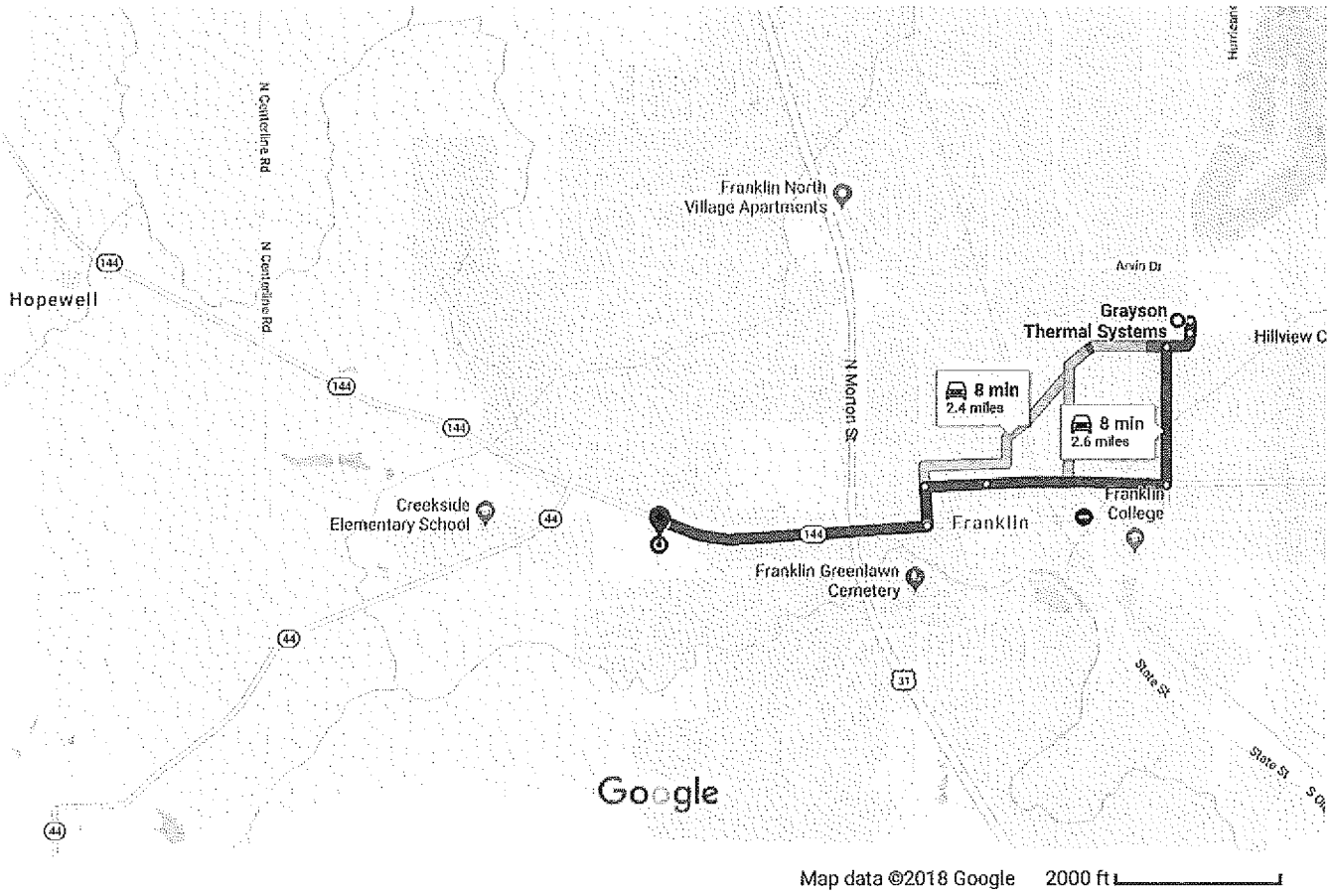
# APPENDIX F

# HOSPITAL AND LOCAL MEDICAL PROVIDER MAPS

Google Maps

# Grayson Thermal Systems to Johnson Memorial Hospital

Drive 2.6 miles, 8 min




## Grayson Thermal Systems

980 Hurricane Rd, Franklin, IN 46131

1. Head south on County Rd 350 E/Hurricane Rd toward E 100 N/Upper Shelbyville Rd

233 ft

2. Continue onto Hamilton Ave

0.1 mi

3. Turn left onto N Forsythe St

0.5 mi

4. Turn right onto E King St

0.6 mi

5. Continue straight onto W King St

0.2 mi

6. Turn left onto Walnut St

0.1 mi

7. Turn right onto W Jefferson St

0.9 mi

# Johnson Memorial Hospital

1125 W Jefferson St, Franklin, IN 46131

These directions are for planning purposes only. You may find that construction projects, traffic, weather, or other events may cause conditions to differ from the map results, and you should plan your route accordingly. You must obey all signs or notices regarding your route.